THE IRON AGE

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Breathing Spells

IN between rounds of a prize fight, the opponents are allowed one minute intervals as "breathing spells." The purpose of these respites is based upon commercial rather than humanitarian motives. If there were no rests allowed, the battle would be of short duration and the customers would not be likely to get their money's worth.

There is a somewhat analogous situation in the case of a cat playing with a mouse. Instead of finishing his job quickly and getting it over with, Tom takes pleasure in prolonging his amusement and his victim's discomfort. As you may have noticed, he will worry the mouse nearly into insensibility, then release him and give him a "breathing spell" until he shows renewed signs of life, after which the process is repeated as long as Mr. Mouse can take it.

The ideal mouse, from the cat's standpoint, would be an indestructible one, who could stand continual torture without needing a breathing spell. As it is, he shrewdly makes allowance for the frailty of mouse nature.

The ideal pugilist, from the fight fan's standpoint would be a pair of nearly indestructible John L. Sullivans, who could "go it" for his sadistic amusement, in bare fisted and gory style for 100 rounds or more.

The ideal opponent and butt for the demagogue would be an indestructible "interest" or business which could be lambasted without let-up for the benefit of the voting audience without jeopardizing its tax-paying, revenue producing power.

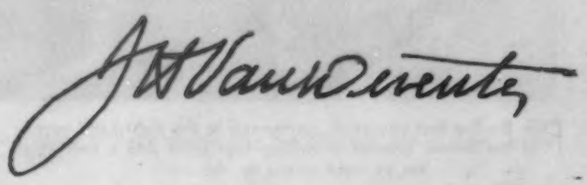
The mouse, who is a simple creature, probably regards each "breathing spell" as the final escape from torment.

The prize fighter, higher up in the scale of intelligence, knows that the "breathing spell" is merely a prelude to another round.

What the business man and the industrialist think about political business baiting "breathing spells" remains to be seen. They will scarcely, in this demagogic age, be as naive as the mouse, who would not be so easily fooled if he knew the immutability of cat nature.

Our President has given us a good rule for measuring such situations when he recommended that judgment be formed not on promises but upon performance.

On this basis, how long do you think the armistice will last?



Fixture Design Important in Using C

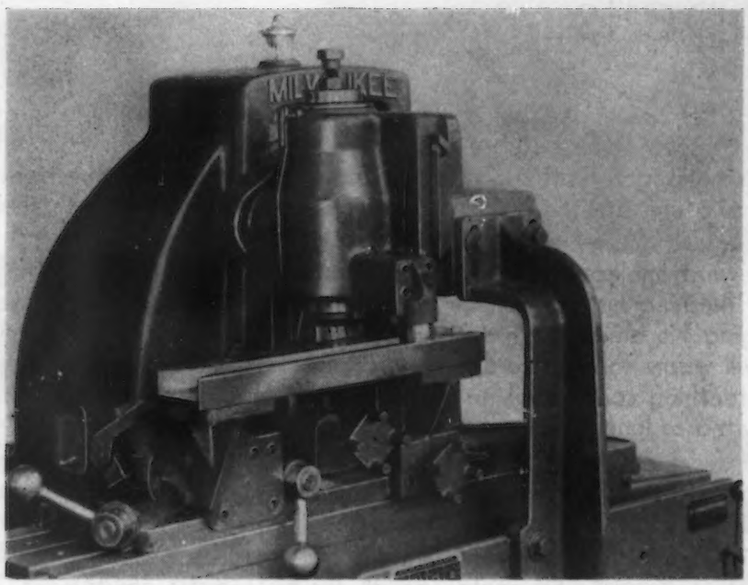


FIG. 1—The vertical head is moved inward by means of a cam and roller in order to avoid interference with the casting.

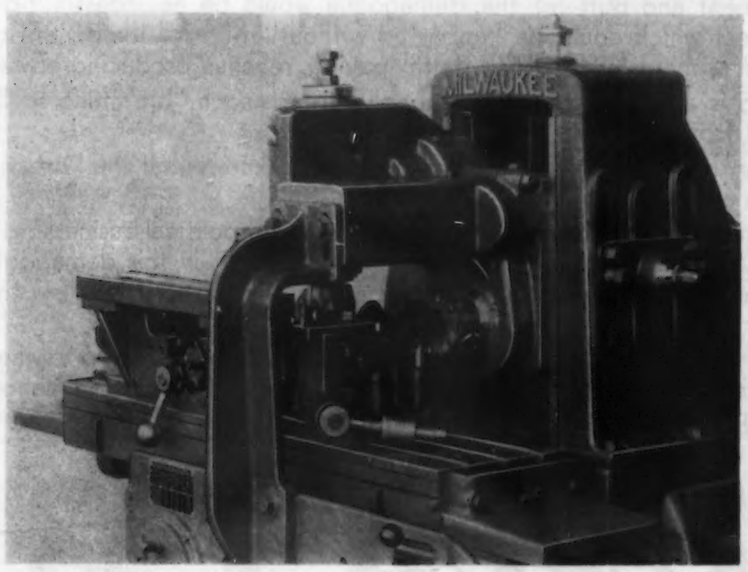


FIG. 2—The first operation, performed in the right-hand section of the fixture, consists of milling four ports and a pad which are at right angles to the ports.

MACHINE tool fixture design is far more important than generally realized, and this is especially true when cemented-carbide tools are used. Many shops have had the experience of machining troubles which were directly traceable to hastily conceived fixtures or to a sense of economy which eventually proved wasteful.

Use of carbide cutters offers no serious problems if the designer has full knowledge of the characteristics and the potential possibilities of this comparatively new cutting material. He must remember that carbide cutters will cut faster and that they will give finer surfaces only if the work is properly supported. This matter of rigidity has been thoroughly thrashed out by machine tool builders who have adequately met the situation. Therefore, with sturdy and rigid machine tools and carbide cutters available to do better and faster work, there must be provided fixtures that fully meet all requirements.

These requirements are: Rigidity of the fixture; adequate support of the part being milled, accuracy both in fixture building and the ability of the fixture to do its part in accurate duplication, and quick and secure clamping.

There are no set rules by which thickness of metal can be accurately determined. One shop which has had much experience with carbide millers arbitrarily doubles the weight of metal. That is, if a ¾-in. web or wall section had been used on a fixture designed for older production methods, then a web about 1½ in. thick would be selected for use with carbide cutters. As a usual thing cast metal is preferred, although some successful

Carbide Cutting Tools

BY FRANK W. CURTIS
Research Engineer, Kearney & Trecker Corpn., Milwaukee.

MACHINING troubles are often directly traceable to hastily conceived fixtures and to false economy in designing them, especially when cemented-carbide tools are employed. Requirements to be met by such fixtures and two examples of good design are outlined in this article by Mr. Curtis, an authority in this branch of machine shop practice.

fixtures have been built of welded steel sections. Any material so placed in the design as to give the required rigidity will prove satisfactory.

The matter of the cost of a fixture due to extra weight of metal should not enter into consideration because with proper design it is entirely possible in many instances to obtain well milled surfaces that result in substantial savings in subsequent operations. For example, there have been instances where grinding operations have been eliminated with resultant savings in labor, power, and burden. A well milled surface will also reduce scraping time and labor. In analyzing the cost of many fixtures it is quite evident that material cost constitutes but a small portion of the total cost. Engineering, labor and burden are by far the largest portion of expense. If the amount of material is doubled, the total cost of a fixture may be increased only 5 per cent or, in extreme cases, as much as 10 per cent. The increase in investment is quite small, yet its importance lies in the fact that insufficient strength may result in failure, as against success with desirable added weight.

Clamping time is a matter of relative importance. For instance, a part which requires 10 sec. for the actual milling operation can probably well afford 4 or 5 sec. for loading and clamping. However, if a part requires 6 sec. for milling then special study must be given to clamping devices which will cut the time to the minimum. It is always well to attempt to reduce the loading time in proportion to the reduction in cutting time. These figures give an idea of what happens when trying to use clamping devices with carbide cutters that were suitable for other types of cutters.

If two or more parts are to be milled at the same time the designer must give attention to quick loading on the part which enters first. This is a time saver because the feed can be started sooner. In most cases there is ample time to load the second and subsequent pieces while the cut is being taken on the first piece.

As a general rule, because of high speeds and fast cuts, a casting must be given support in more places when carbide cutters are used. All tendency for deflection must be eliminated. For instance consider, for example, a channel section standing on its legs and to be milled across the end. Experience has proved that deflection of the web or back will result in a poor surface unless means are taken to support the web. It is not

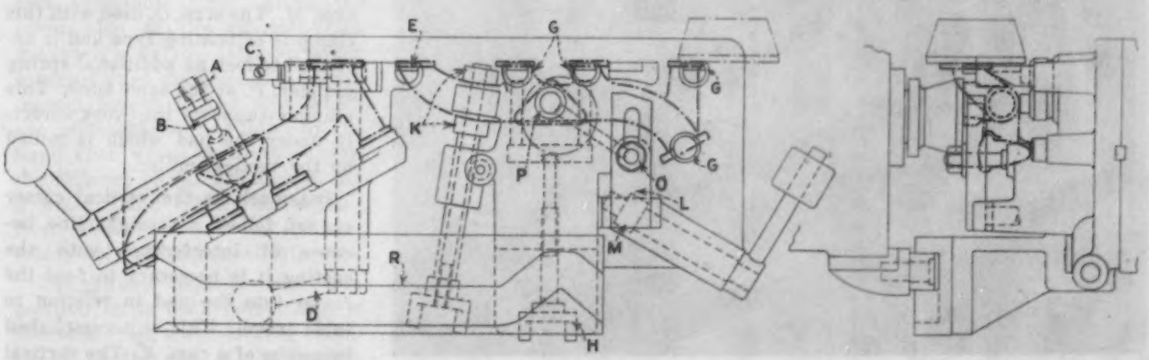


FIG. 3—Two manifolds are mounted in this fixture and cuts are taken in three planes only two of which are at right angles to each other.

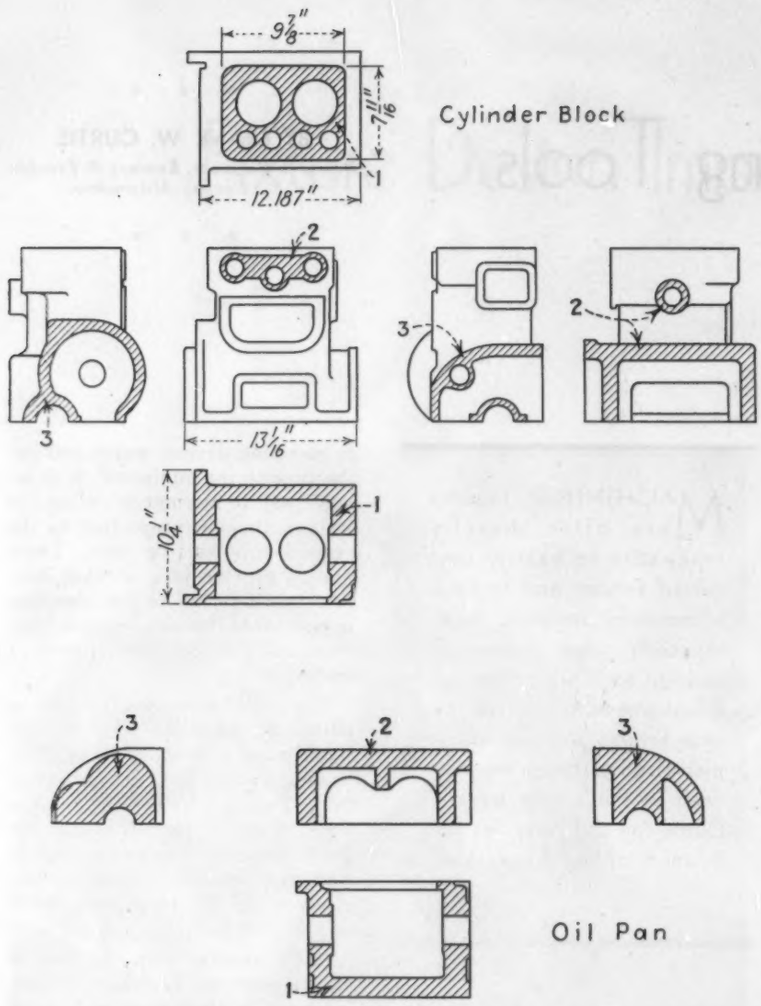


FIG. 4—The various operations on this cylinder block and oil pan are handled together; that is, one block fixture and one pan fixture are used simultaneously.

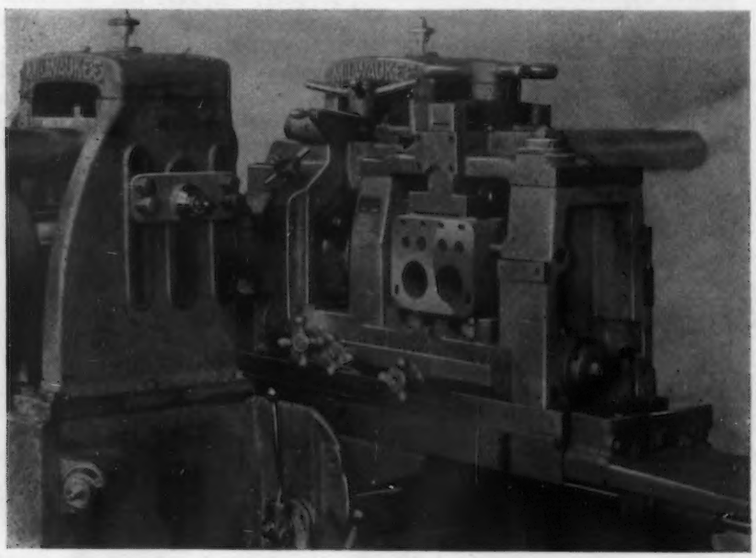


FIG. 5—This double fixture holds one cylinder block and one oil pan.. This is the set-up for the first operation. Note massiveness of fixture construction.

sufficient to clamp the part merely at or near the legs. This is mentioned because with many similar jobs end supports only have been sufficient for the slower feeds and speeds of high-speed steel cutters, but when the rate of cutting is increased additional center supports are definitely needed to eliminate chatter.

Spring plungers and supports can often be added as an afterthought if trouble develops, but with careful study these can be incorporated in the original design. Then, too, they can often be actuated in combination with other clamps so that no additional efforts are needed to adjust and lock them.

Fixture for Holding a Manifold

An excellent example of a fixture for holding a manifold to perform two operations is shown in Figs. 1, 2 and 3. On this part there are four ports in line that must be finished, also a pipe flange which is at an angle to the ports, and a carburetor pad which must be finished by a vertical miller. The fixture is designed to hold two manifolds so that the cutter on the horizontal spindle can finish the four ports of one manifold and the pipe connection of another. The vertical cutter catches the pad on the set-up in which the four ports are milled. See Fig. 3.

The first operation is performed in the right-hand section of the fixture which is provided with three fixed points one of which is indicated at *E*, on which the manifold rests. The center ports are supported by two spring plungers, *G*, which are locked by means of the hand knob, *H*. Additional clamping is obtained by means of the floating jaw clamp shown at *K* and the clamp, *L*. The latter slides over the work and is actuated by the cam, *M*. The stud, *O*, used with this clamp is of floating type and is arranged to lock an additional spring plunger, *P*, at the same time. This plunger supports the work directly under the pad which is milled by the vertical miller.

Inasmuch as the vertical cutter cannot follow a straight line because of interference with the casting it is necessary to feed the cutter into the pad in relation to table travel. This is accomplished by means of a cam, *R*. The vertical head is of sliding type and by means of a cam roller and the cam

the head is fed inward at the correct position.

The second operation is performed in the left-hand section of the fixture which provides for milling the exhaust pipe flange which is at an angle to the ports. The work is located from three finished ports and the pad which is at right angles to the ports. The manifold is held by two clamps. The clamp *A* is of hinge type and can be withdrawn to facilitate loading. When it is brought into clamping position, the head of the bolt, *B*, is turned as shown. This clamp is operated by means of a cam which engages a pin which bears against the heel of the clamp. This clamp is locked by means of a handle at the extreme left. Another cam-operated clamp at *C*, which is operated by the handle *D*, holds the work solidly against a fixed stop very close to the portion to be milled.

Engine Block and Oil Pan Fixtures Another Example of Good Design

Another fine example of fixture design is afforded by a two-cylinder gasoline engine block and oil pan. Fig. 4 shows general dimensions of the block and pan and also shows the surfaces to be milled and the sequence of operations. The material is cast iron and the depth of cut varies from 3/32 to ⅛ in. All surfaces are milled. The various operations on the cylinder block and oil pan are handled together; that is, one oil pan fixture and one cylinder block fixture are used simultaneously. Three sets of fixtures are needed and the operations require two 10-in. cutters.

The first operation on the cylinder block consists of milling the top and bottom surfaces. Work is located from the crankshaft bore and the cylinder head end rests on two adjustable pins. Along the lower side of the cylinder-block fixture is a narrow table on which a target gage may be set to obtain correct height of the pins which are adjustable up and down by the hand knob which is directly below the cylinder block. See Fig. 5. As a usual thing when this adjustment is once made checks are necessary only at infrequent intervals.

The cylinder block is drawn into position by a hook bolt which is operated from a self-locking clamp shown at the end of the fixture. Four heavy-duty spring plungers support the crankcase end. These

FIG. 6—Note stop bars used to locate crankshaft bores. Four jacks support each piece.

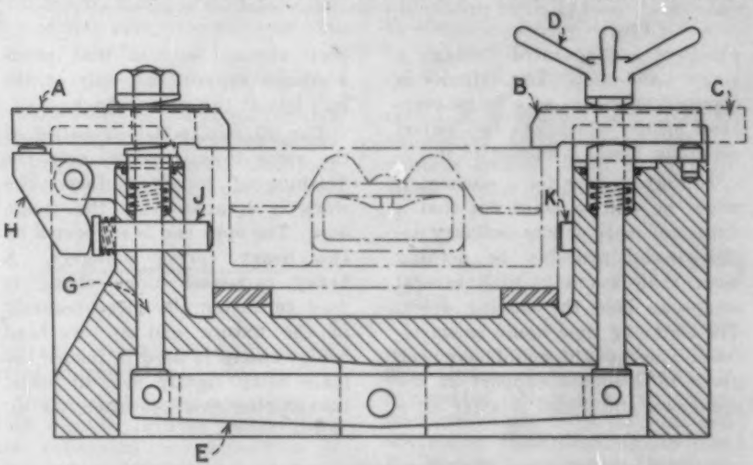


FIG. 7—Sketch showing clamping of an oil pan for operation No. 2.

FIG. 8—On the second operation both sides of the cylinder block and one side of the oil pan are milled.

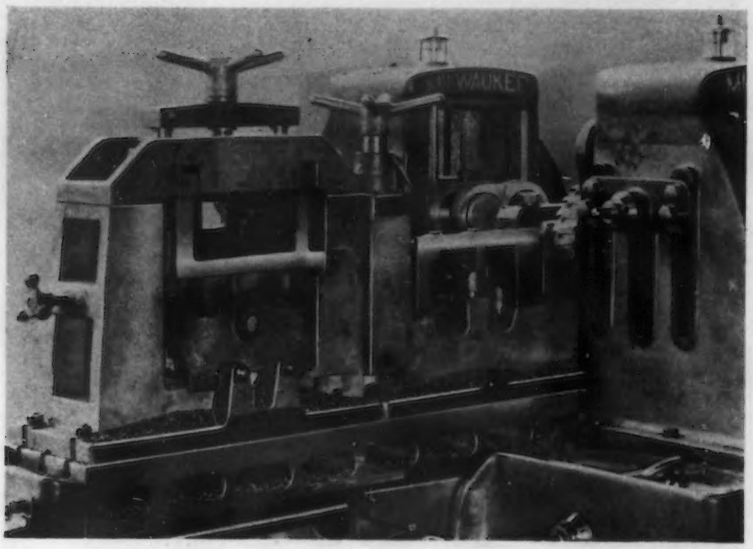


FIG. 9—The cylinder block is held firmly by two clamps which are located in the bridge of the fixture.

plungers are operated through a single hand-knob. The cylinder is clamped by means of a large overhead bridge which has two swivel clamping blocks attached to it.

To digress here for a moment it might be well to point out that a fixture of more or less ordinary design would probably be nothing more than a cradle with several straps to hold the casting down. The clamping time would be wasteful and no thought would have been given to adequate support of the crankcase end which is after all a deep channel section that needs adequate support not only at the legs but at the web or back.

The oil pan, which is milled at the same time, requires only the finishing of the front face. The work is located from the rough bore. The open end is supported by two heavy spring plungers. A heavy cast-steel hinge clamp is used to fasten the piece securely in the fixture and an overhead bridge clamp is used to insure the piece being rigidly held in place. In handling this operation the oil pan is loaded first, then the table feed is applied and then the cylinder block fixture is loaded. The feed is 17 in. per min.

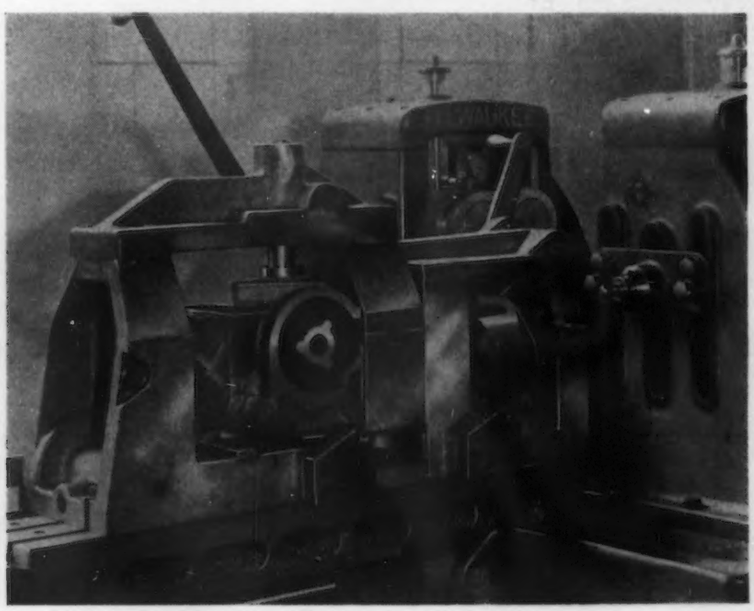


FIG. 10—These fixtures are fast loading and clamping. Only one handle is used for the oil pan side and two handles for the cylinder block side.

Second Operation

The second operation is the milling of both sides of the cylinder block and one side of the oil pan. The oil pan is located from the previously milled joint face and is alined by two spring plungers which fit into the rough crankshaft bore. The work is held in place by two heavy strap clamps. These clamps are tightened by means of a large pilot wheel at the top of the fixture. A spring plunger is used to support the center portion of the surface being milled.

Referring to Fig. 7 which shows the oil pan clamping devices, clamps *A* and *B* are of sliding type and can be withdrawn, as shown dotted at *C*, to permit loading and removal of the workpiece. After an oil pan is placed into the fixture, both clamps are set inward to the clamping position, then the handwheel *D* is tightened. This brings action on the link *E*, causing the clamp bolt *G*, to pull the clamp *A*, downward. The heel of this clamp rides on the hinged plate *H*, so that the pin *J* strikes the work, causing it to become located against the button *K*. Continued turning of the handwheel, *D*, then tightens both clamps securely. One motion only is required to locate the work endwise, as well as to clamp it.

The cylinder block is located on two hardened plates and, as shown, rests up-side-down on the previously milled cylinder head face. Alinement is obtained by means of two spring plungers which enter the rough cored cylinder bores. End clamping is by means of two spring plungers at the right-hand end and a sliding bar at the left-hand end, which are operated through a self-locking clamp. The work is held firmly in place by means of two clamps, located in the bridge of the fixture, that are operated by a pilot wheel. The port face is milled by a 4-in. tungsten-carbide cutter, and the opposite side is milled by a 12-in. tungsten-carbide cutter. Approximately ⅛ in. of material is removed and a feed of 17 in. per min. is applied.

Third Operation

The third operation consists of milling both ends of the oil pan

and cylinder block. Both fixtures are of the quick-operating type. The oil pan is inserted in the fixture until a flange on the opposite side strikes a stop, which provides end location. The self-locking clamp is then engaged. This works through a pinion and rack, causing the swiveling clamps on each end to clamp against the work. This is the operation of a single handle, the device being quick, fast, accurate, positive and dependable.

The cylinder block fixture is also quick acting. The block slides in on two hardened plates against a stop. The handle at the lower right is engaged, causing two sliding blocks to force the work so that the cylinder head face bears against two hardened plates. This motion is through racks and pinions, running through the fixture to the opposite side. The operator then engages the upper handle which causes the heavy clamp in the bridge to contact the work and clamp it securely in place. Only two motions are required. Two 10-in. cutters are used.

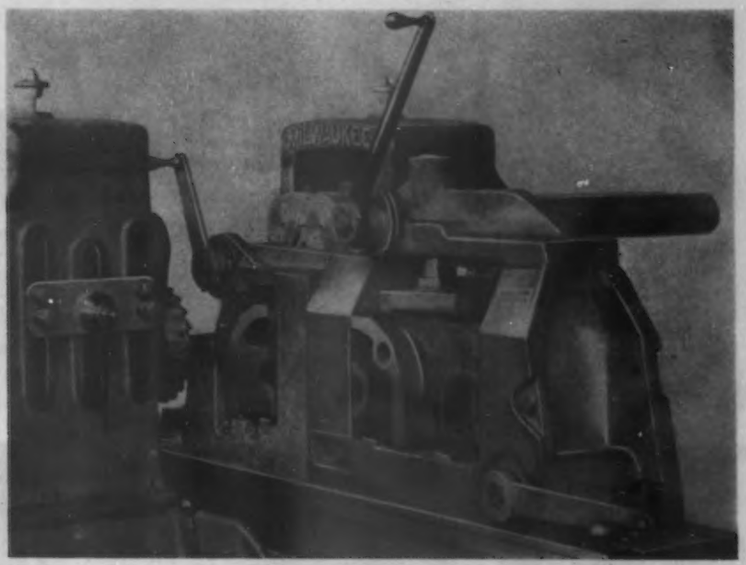


FIG. 11—The handle at the lower right causes two sliding blocks to force the cylinder head face against two hardened plates. This motion is obtained through rack and pinions.

Close study of the above fixtures reveals ample weight of metal and its proper distribution. Clamping devices are strong and positive and special attention has been given to supporting the castings so that advantage can be taken of the full value of carbide millers.

Insulating Refractory Concrete

A NEW hydraulic insulating refractory concrete known as Insulcrete that takes the place of fire brick and insulation combined in poured refractory furnace linings, boiler baffles, etc., has been developed by the Quigley Co., Inc., 56 West Forty-fifth Street, New York.

This new development is said to possess the unique properties of interlocking crystalline minerals forming a cellular heat-insulating, heat-resisting, high load-carrying, and low permeation refractory. Also, because of its low heat storage, and low thermal conductivity when poured to form a lining or baffle, the boiler or furnace becomes more sensitive to automatic control, saving fuel and increasing output. Insulcrete makes monolithic (jointless), air-and-gas-tight furnace linings.

It is stated that Insulcrete does not shrink after being poured in furnace wall or boiler baffle, i.e., 1 cu. ft. in a dry state weighs 60 lb., and after mixing with water, poured and allowed to acquire hydraulic set for 24 hr. 1 cu. ft. dried weighs 60 lb.

Under continuous operation at 2500 deg. F. furnace temperature the expansion or contraction is said to be negligible.

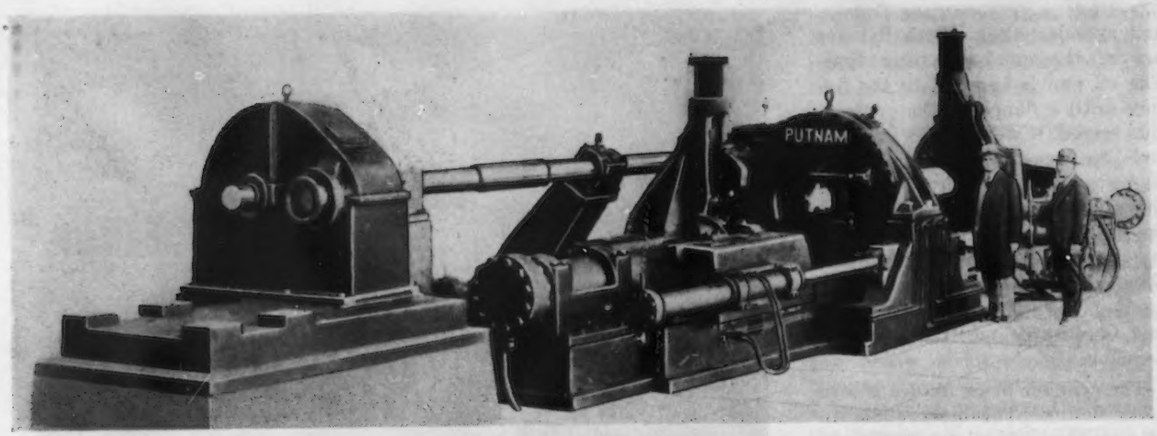
Insulcrete at a mean temperature of 1100 deg. F. has a thermal conductivity of 3.13, it is stated, compared with first quality firebrick which at the same temperature has a thermal conductivity of 8.16. It is a 62¼ per cent better insulator and has less than half the heat storage of firebrick, which makes it a saver both of fuel and time.

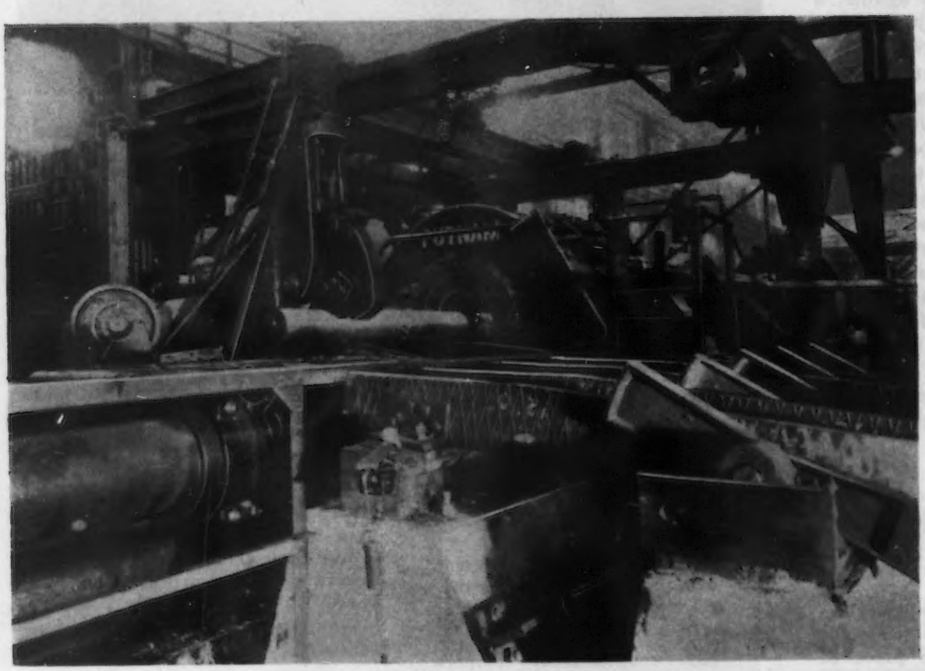
Insulcrete is recommended for all types of heat treating furnaces, flues, pot furnaces, boiler walls and baffles, ovens, open-hearth regenerators, stack linings, doors, soaking pit covers, malleable iron annealing furnaces, producer and blast furnace gas mains, oil refining furnaces, galvanizing tin furnaces, etc. The relining of existing furnaces with the new material, it is stated, will pay for the cost of the improvement many times over the first year used based on the saving in cost of fuel.

Small gas forging, wire drawing, heat treating furnaces, etc., may be cast in a single piece. Gas-fired Insulcrete-lined furnaces, it is asserted, attain a working temperature in one-third the time and operate at approximately 100 deg. F. higher temperature than an ordinary fireclay brick furnace.

Chromium Steels Are Reviewed

HIS Majesty's Stationary Office, Kingsway, London, England, has just published a comprehensive book on chromium steels edited by Richard Henry Greaves. The volume is for the most part a review of published information on the constitution, treatment, mechanical and physical properties of plain chromium steels, presented in such a way as to be exceedingly valuable and interesting to metallurgists and engineers. It provides, in an accessible form, numerical data extracted from hundreds of sources and contains a critical survey of methods of chemical analysis applicable to chromium steels. Some hitherto unpublished work at the research department, Woolwich, is also described.





ABOVE

FIG. 1—Billet peeler on erecting floor.

o o o

BELOW

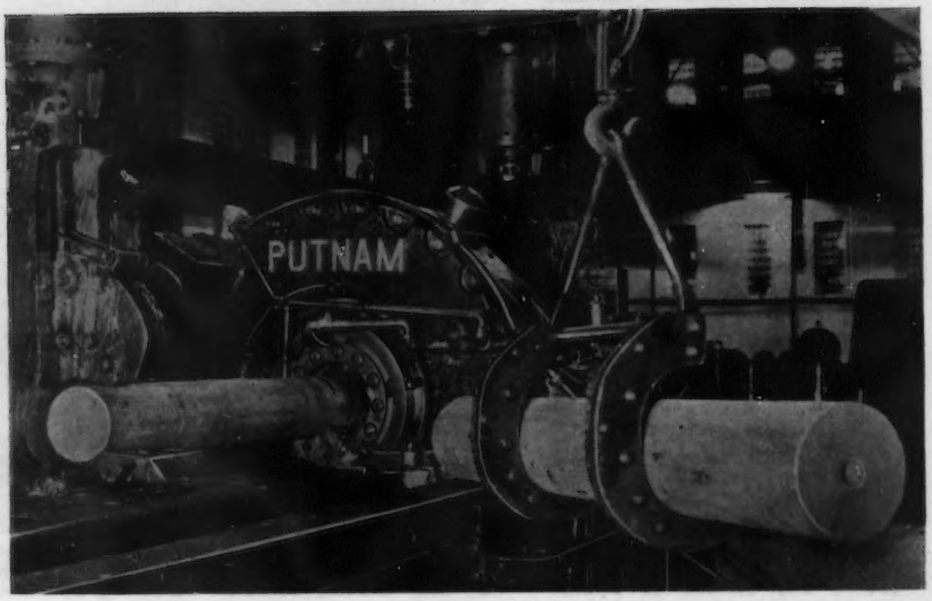
FIG. 2—Billet is pushed through the revolving cutting tools by the entering side carriage until it is gripped by the discharge side carriage.

o o o

ABOVE

FIG. 3—Billet as it is pulled through the cutting tools by the discharge side carriage. Paralleling stops on discharge bed are shown in the right foreground.

o o o



Peels 8¼-In. Round Billets At Rate of 20 Tons An Hour

BY M. M. McCALL

BILLETS 8¼ in. in diameter are turned to 8 in. at the rate of 480 tons in 24 hr. on the machine here described, which is designed for turning the surface of unstraightened billets up to 12 in. in diameter and 12 ft. in length. Two unskilled operators easily handle the machine, one operator on the hydraulic feed and air clamp valves and the other on the crane controls.

THE surface of round billets which are used in the manufacture of seamless steel tubing must be carefully conditioned to produce a good product. As there are many invisible cracks and checks concealed under the scale, it is advisable to completely remove the scale from the billets.

This operation is performed on the Putnam billet peeler, which is shown on the erecting floor in Fig. 1. Figs. 2 and 3 show installation views. This machine is capable of rapidly turning the surface, to a uniform depth, from unstraightened round billets. The term "uniform depth" means that the centers of gravity of the rough section and of the finished section approximately coincide, the cut following the camber of the billet. It has been found that by taking a cut ⅛ in. deep, reducing the diameter ¼ in., practically all of the surface defects are removed. The machined surface is smooth and of such a texture that any remaining defects may be readily detected.

Billets up to 12 in. diameter and 12 ft. in length are handled on the machine shown in the illustrations. Equipment has been built, however, to handle billets of greater lengths.

The machine is fitted with a central cutter-head securely bolted and keyed to the bed. The entire tool-holder assembly is self-contained and may be quickly removed and a new tool holder placed in the machine when the cutting tools become dull. Necessary provision for accomplishing this change is included in the design and consists of a hinged mandrel attached to the right hand, or discharge side, carriage. This mandrel may be swung into position with its axis coincident with that of the tool holder. By moving the carriage, the tool holder is pushed out from the cutter head and is removed by the loading crane. A second tool holder with sharp tools is placed on the mandrel and drawn into the seat in the cutter head. Fig. 4 shows the self-contained tool holder removed from its seat and suspended on the hinged mandrel.

The tool holders are arranged for six cutting tools 3 in. x 2 in. The tools are clamped and adjusted in the tool holder before placing it in the machine. A gage, pictured in Fig. 5, is used to properly set the tools to cut the required diameter.

The tool holder is driven by two large keys, diametrically opposite, and the thrust is taken against a shoulder in the hub of the cutter head gear, only two bolts being used to keep the tool holder in position. A pair of tool holders is furnished for each inch of billet diameter. Internal adjustment of the tools provides for fractional diameters.

A 200-hp., 3-to-1 adjustable speed motor, rotates the tool holder through a herringbone reduction unit and a herringbone pinion and gear in the cutter-head. The gear in the cutter-head runs on a large bronze-lined taper bearing having adjustment for wear. Thrust of the cutting tools is taken by a large circular bronze track on the inner face of the main housing. A hardened steel ring, fastened to the face

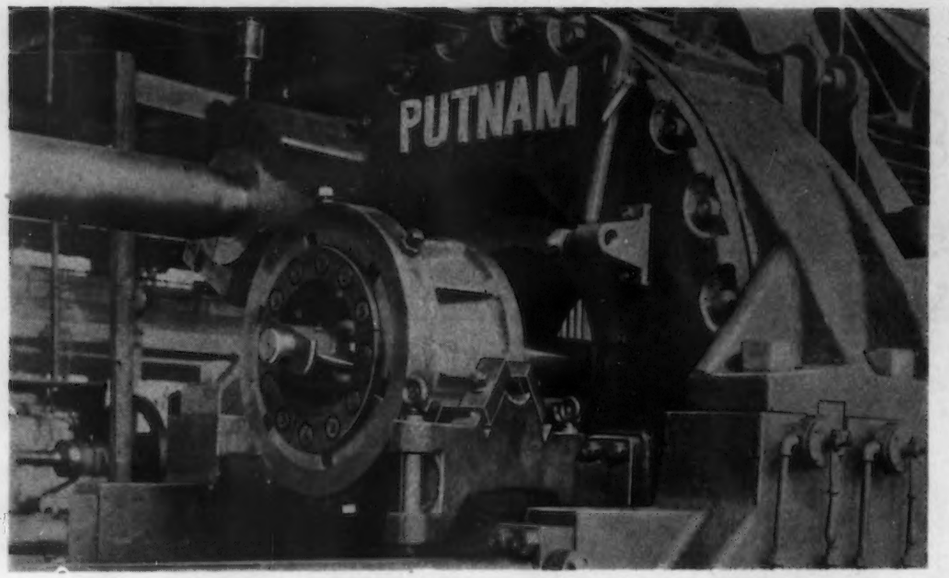


FIG. 4—Tool-holder suspended on mandrel as it is being removed from cutter head. Duplicate tool holders are furnished for each range of billet sizes. One set of tools is being sharpened while the other is in use.

of the gear bears against this track.

Massive feet are provided on the main housing for bolting to the bed. These feet are carried well up toward the center, eliminating the tendency of the cutter-head to tip, due to the feeding pressure. Provision is made to keep the lubricating oil from leaking out and likewise to prevent cutting compound and scale from entering the head.

Two carriages are mounted on the bed, one on each side of the central cutter-head. The left-hand carriage, shown in the foreground of Fig. 1, carries the entering side grip. After the billets are placed on a skidway by the mill crane, they are picked up by the loading crane with the special hooks as shown in Fig. 2. The billet is placed in position with one end resting in the lower jaws of the entering side grip, and the other end in the adjustable V-block on the front or entering side of the cutter-head. The upper jaw is on a counterweighted hinged member operated by a wedge and pneumatic cylinder to provide ample opening for placing the billets in the jaws. There are three serrated jaws, one mounted on an adapter plate in the hinged member, and two mounted on an adapter plate in the main casting. The jaws slide in tapered pockets in the adapter plates, so that as the torque increases in the billet, the jaws slide up the taper and grip proportionately tighter. When the chuck is closed by the pneumatic cylinder and wedge, sufficient pressure is set up on the billet to insure the jaws sliding up the tapered slopes when the cut starts. The opening and closing of the jaws is controlled by an air valve, placed in a convenient position for the operator. A set of adapter plates and jaws is provided for each size of billet to be handled.

The carriage feeds the billet through the cutter-head by hydraulic pressure. The entering side feed cylinder is placed between the ways of the bed, its plunger being connected directly to the carriage. The push back cylinders are fastened one on each side of the entering carriage, their plungers thrusting against the bed, next to the cutter-head.

As the peeled end of the billet emerges from the discharge side of the cutter-head, it is gripped by the jaws mounted on the right-hand or discharge side carriage. The lower jaw member is actuated by a small air cylinder and is normally in its lower or outer position, well clear of the billet as it emerges from the cutter head. When the air valve is opened, this lower jaw member first runs upward into contact with the billet. The hinged member containing the two upper jaws then descends, and as these jaws are mounted on a circular adapter plate, this plate will revolve in its seat until both upper jaws are in contact with the work. It is evident that this type of grip will find and clamp the billet in whatever position it may be in, due to its out of straightness. It is therefore not necessary to stop the cutter-head and release the entering side grip before closing the discharge side grip.

When the billet is gripped by the jaws on the discharge side carriage, the jaws on the entering side carriage are released and the carriage is returned to the loading position by rapid movement through the push-back cylinders. The gripping jaws are opened a sufficient amount to clear the hot saw fins on the end of the billet.

The discharge side carriage is fed by hydraulic pressure and pulls the billet through the cutter-head. As soon as the billet is clear of the cutting tools, the feed movement of the carriage may be changed to a rapid movement until the billet clears the cutter-head and will roll down the skids on the discharge carriage when the jaws are released. The discharge side feed cylinders are fastened one on each side of the discharge side carriage, their plungers thrusting against the bed, next to the cutter-head. The push-back cylinder is placed between the ways of the bed, and its plunger is connected directly to the carriage. A set of adapter plates and jaws is provided for each size of billet to be handled.

Fig. 3 shows a peeled billet as it is pulled through the cutter-head by the grips on the discharge side carriage. When the grips are released, the billet will roll down the skids on the discharge side of the cutter-head and the discharge side carriage. A discharge bed or skidway is provided to receive the billets. As the discharge bed is usually made quite long, it is important that the billets do not start down the skids in a skewed position. To prevent this, a set of air-operated

paralleling stops are mounted near the machine on the discharge bed. The stops project up between the skids and are pulled down, after the billet has rolled against them, by an air cylinder operated by an air valve placed in a position convenient to the operator.

Figs. 3 and 6 show the hinged mandrel which is used to change the tool-holders. It is swung out of the way and held on the rear of the discharge side carriage.

The front and rear ways of the bed are covered with renewable hardened and ground steel wearing plates. Bronze plates are attached to the mating surfaces on the carriages. A large rectangular opening is provided in the bed under the cutter-head through which chips and cutting compound fall into a pit in the foundation. The chips are removed by a conveyor, and the cutting compound is repumped to the tools by a motor-driven pump.

Two unskilled operators easily operate the machine to its maximum capacity, one operator on the hydraulic feed and air clamp valves and the other on the crane controls. A cutting speed of 40 ft. per min. and a feed of ½ in. per tool, or 3 in. per revolution of the cutter head (there being six tools), is easily maintained.

It is interesting to note that on 8¼ in. diameter billets, being turned to 8 in. diameter, approximately 5740 ft. or 480 tons are easily handled in 24 hr., leaving a liberal time allowance for changing tool holders, etc. A set of tools stands up three to four hours before becoming dull.

A billet peeler of new design is now being developed by the Niles Tool Works. As the machine is to handle long billets, the carriages will be moved along the bed by electric power to avoid the necessity of using long hydraulic cylinders. Each carriage will be moved along the bed by a nut on a separate screw. Each screw will be rotated by a 6 to 1 adjustable-speed motor driving through a speed reducer. It is very likely that the carriages will be moved by electric motors on all future machines regardless of the length of the billet.

To feed a long billet through the cutter-head it is necessary to grip it several times with both the entering side and discharge side carriage. As it is being fed by either carriage, the other carriage is traversed back to the position where a new grip may be taken.

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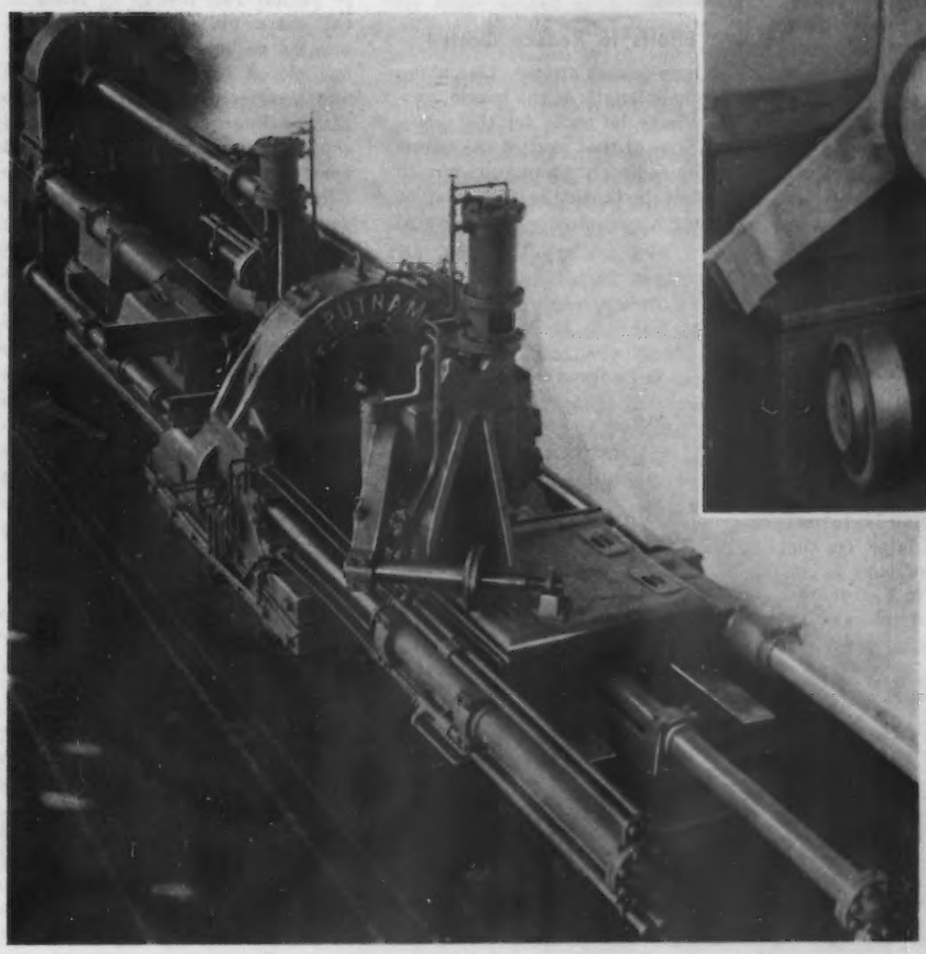
FIG. 5—Gage for setting tools to cut the required diameter. The arms fit the tool-holder and the tools are set against a disk of proper size.



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AT LEFT

FIG. 6—View showing mandrel for handling tool-holders when it is swung out of the way on the discharge side carriage.

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Composite Rolls*

Review of Typical Designs In Use

THE cutting of rolls for the rolling of shapes and light sections of unusual dimensions is a costly item in modern rolling mills. In the case of rolls for heavy sections, such as rails and structurals, several passes are provided on a single roll and the whole length of the barrel is used, which precludes any marked economy in the turning and machining of the rolls. The situation is altogether different in rolls used for rolling small shapes and sections, which are usually rolled on double-duo or small three-high mills, only one pass being made between each pair of rolls. Each pass being independent of the other facilitates rapid adjustment of the rolls and permits small errors in calibration to be readily corrected. The replacement of defective rolls and interruptions in a rolling program are, moreover, infrequent in mills of this type. As long as it is possible to work with open passes, the cost of turning a roll is determined solely by the size of the section required. Thus to roll a section of the shape shown in Fig. 1*a*, only the shaded portion *a* in Fig. 1*a* need be turned from the upper roll and portion *b* from the lower roll, the rest of the barrel remaining unusued or may be turned for other open passes later. On the other hand, if a closed pass is cut for the section shown in Fig. 1*c*, the whole length of the barrel must be turned, which not only considerably increases the machining costs but makes rolling costs much greater than when using open passes. To reduce these costs by using only a few closed passes or to dispense with them altogether is not practicable with certain sections, as with some sections open-pass rolling is rendered so difficult and the time of adjustment made so long that whatever is saved in turning and machining costs is more than discounted by the increased costs of rolling.

*Report of H. Cramer to the Verein deutscher Eisenhüttenleute.

Efforts to Reduce Costs

Where passes are provided along the whole length of the barrel, provision may be made for the subsequent use of that part of the barrel not immediately employed, but in the first instance the high cost of turning a roll must be met. Several methods have been evolved to reduce roll-making costs, but without much success. Thus eight similar closed passes are provided along the barrel, when only one is required, in the hope that repeat orders may enable the seven extra passes to be utilized. If repeat orders are placed, the cost of making the roll is sufficiently spread over to warrant the first high cost, but usually the demand for small sections of special shape is too small to permit full use to be made of the extra passes. The first cost may be reduced by providing only one closed pass along the barrel and a series of blind passes which can be later cut to the required shape. A practicable plan followed here is to make the width of the blind passes progressively greater, say in steps of 1 mm. from 20 to 26 mm., where seven blind passes are provided. A third method is to cut the closed pass in one end of the barrel and leave the rest of its length available for subsequently cutting open passes as required. The cost of making a roll of this type is less than in the two previous methods, but apart from the high first and subsequent costs these methods possess various serious drawbacks and introduce a number of difficulties in actual rolling.

The disadvantages of these methods have led to the evaluation of "ring rolls," comprising rings mounted on the rolls, such rings

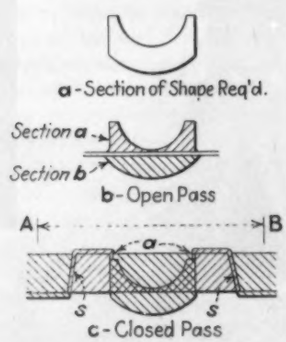

FIG. 1—Section of shape (a) required, with open (b) and closed (c) passes necessary.

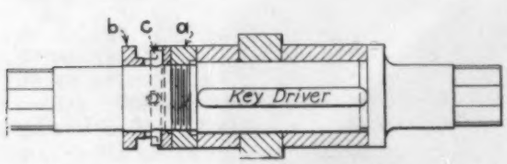

FIG. 2—Attachment of roll ring with nut and key.

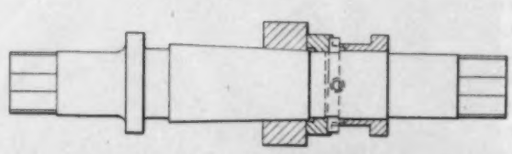

FIG. 3—Shrunk-on roll ring.

being of a width sufficient for cutting the pass required with proper allowance for the edges. Thus, for the pass shown in Fig 1*c*, a ring of width AB is required. These rings are secured to the roll barrels by various means, typical examples being shown in Figs. 2, 3 and 4. In Fig. 2, the roll ring is secured laterally to the barrel by the nut *a*, whose diameter must be the same as that of the roll neck. Nut *a*, which is right-handed or left-handed, according to the direction of rotation of the roll, is secured by the bush *b* and the key *c*. On the other side of *b* lies the collar of the roll bearing. The roll ring is driven by the roll through the feather key. In using this form of attachment, the bore of the ring must be accurately machined and make a good fit on the roll barrel. Owing to the heat developed during rolling, the ring usually loosens gradually, and this is the main disadvantage of this type, and which also precludes the use of chill-cast rings.

Ring Shrunk On at High Temperature

These disadvantages are overcome in the arrangement in Fig. 3, where the ground coned ring is shrunk on to the ground coned barrel, which thus dispenses with means for securing and driving the ring. Laterally, the ring is also bushed and keyed. But to prevent the ring loosening on getting hot in rolling and slipping under high rolling pressure, it is essential to shrink on the ring at a fairly high temperature, which again prevents the use of chill-cast rings. A suitable steel for these rings is a manganese steel of 1.2 per cent. Mn and about 0.5 per cent. C. A special hydraulic stripper is also required for removing the ring from the barrel after use.

Further improvements are incorporated in the design shown in Fig 4, where the barrel is made in two parts, securely keyed together after the roll ring has been mounted in position. As the diameter of the barrel, owing to its sectional design, can be made smaller than the diameter of the roll neck, more durable chill-cast rings can be used than in the two previous methods. On the other hand, a high-grade chrome-nickel steel must be used owing to the reduced diameter of the barrel. At the side the ring is bushed and keyed. The

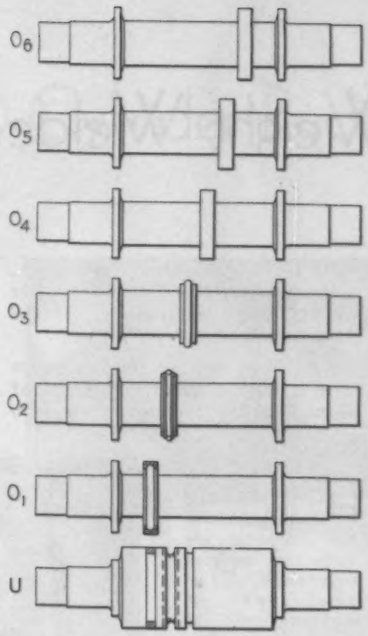

FIG. 5—Set of single-roll composite rolls.

ring does not run slack as easily in this arrangement as in the previous ones, as the heat evolved does not reach the center of the ring so quickly owing to its greater width. Also, the four driving keys counteract slipping.

The use of roll rings reduces the machining of the passes to a minimum, and the work entailed is purely determined by the dimensions of the shape required. Redressing is also limited to the roll ring, and does not embrace the barrel. The cast of the individual rings is comparatively small, although the provision of a barrel with rings throughout its length would cost more than dressing and machining the roll itself. Mills which roll large quantities of shapes and sections have adopted the use of ring rolls from considerations of economy, and have put up with their various drawbacks. On the other hand, other mills rolling only a small tonnage of shapes still employ the direct dressing and machining of the rolls.

Recent Type of Ring Roll

A more recent type of ring roll, designed by Hermann Irle, G.m.b.H., of Deuz-Siegen, claims to remedy the disadvantages of previous types, and consists essentially of a series of integral ring rolls, as shown in Fig. 5. The bottom roll U is provided with six separate top rolls O_1 to O_6, on each of which the ring is located at a different point along the barrel. To dress the rolls for a particular section, the necessary pass is cut in roll O_1, and in the corresponding part of the barrel of U, so that only the shaded portion has to be machined. The second section is provided with a pass in roll O_2 and its corresponding position in the barrel U, and so on along the whole length of U. Thus, for six sections seven rolls are required. More complex ring rolls have also been evolved for three-high and four-high mills, and with two or more rings on each roll, each ring being dressed and machined according to requirements. The cost of turning and finishing the rings is reduced to the minimum, while there is also a considerable saving in roll costs as against the old cylindrical rolls. The principal advantage claimed for these new ring rolls is that rolls of standard composition and dimensions can be used, making these rolls suitable for all mills, and not only for those rolling shapes and sections.

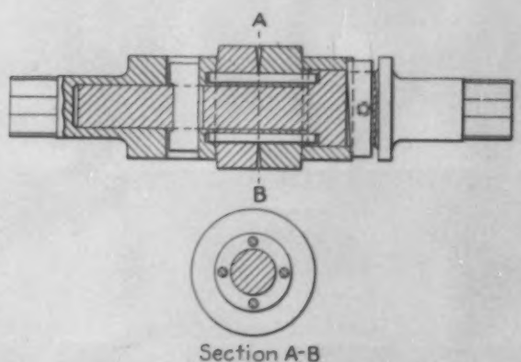

FIG. 4—Compound ring roll with four keys.

Light-Weight Welded Steel Members

FOR use in rail cars, switching locomotives, power plants and industrial and marine service, the Continental Motors Corpn., Detroit, is building a 10-cylinder radial two-cycle Diesel engine, which develops 450 hp. at 900 r.p.m.

As light weight is essential, the crankcases are constructed of welded steel. They weigh 475 lb., after machining, a weight ratio of slightly more than 1 lb. per hp. The engine itself, complete with all accessories, weighs 3900 lb., a ratio of 8.66 lb. per hp.

Design of the welded steel crankcase was developed by the Continental Motors Corpn., in cooperation with Lukenweld, Inc., Coatesville, Pa., the latter company also fabricating this part. The crankcase is made in two halves, the sections being split vertically and bolted together in the engine assembly. Welding is done with covered electrodes under insurance procedure control and the finished structure is thoroughly furnace stress-relieved. All-weld metal specimens deposited with the electrodes used in fabrication showed a yield point of 65,000 lb. per sq. in., ultimate strength of 95,000 lb. per sq. in., and elongation in 2 in. of 24 per cent.

The front half of the crankcase is a welded assembly of plates of high tensile Lukens Cromansil steel and S.A.E. 1020 carbon steel. The rear half, which carries a number of bosses, is also a welded assembly of Cromansil steel, S.A.E. 1020 carbon steel, and electric furnace steel castings which were used to form the periphery of the cam pocket due to the intricate contours involved around the push rod guide bushing and the bolts tying the two halves of the crankcase together. The castings were made in units of one per cylinder and the entire assembly welded into one ring, which was inspected and machined before welding into the balance of the assembly.

In both sections of the crankcase, high tensile Lukens Cromansil steel was used in the main stress members, with carbon steel in parts of secondary importance.

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HIGHLY stressed members of the crankcase are made of low-alloy high-tensile Cromansil steel. A weight ratio of slightly more than 1 lb. per hp. is obtained.

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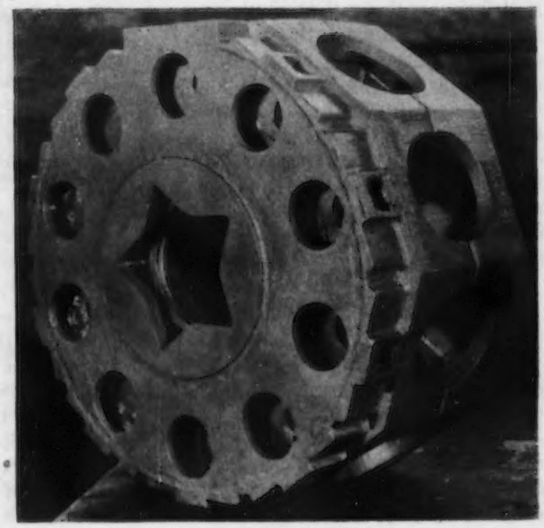
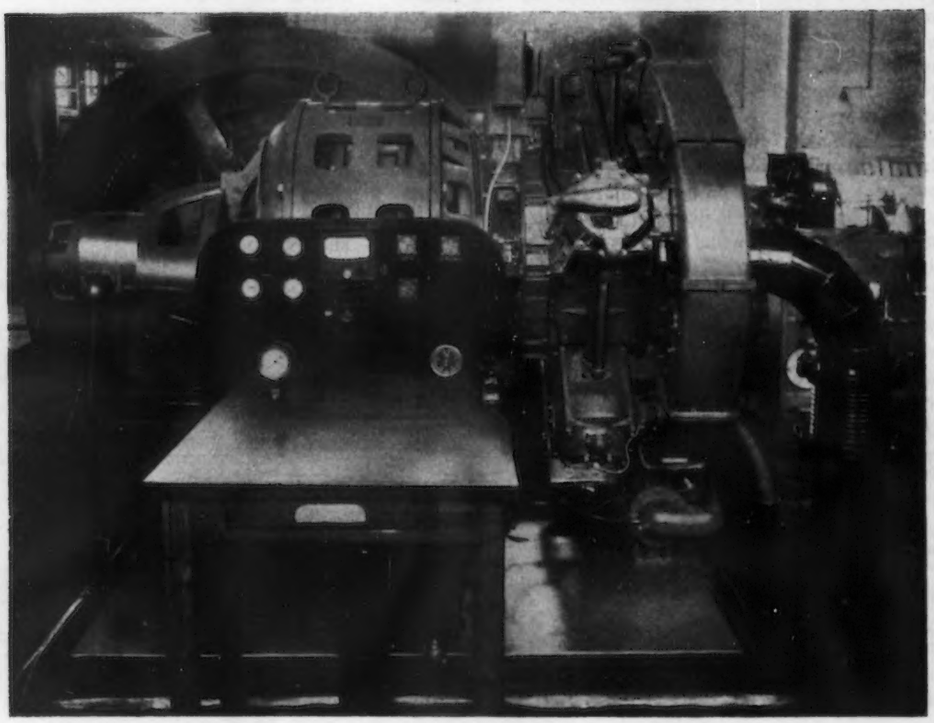
BELOW

CONTINENTAL radial Diesel engine with welded steel crankcase and combination oil sump and base, also of welded steel.





Used in New 10-Cylinder Radial Diesel

The main ring, main web and all the ribs, which aid in the transfer of the cylinder stresses to the main web, are of Cromansil steel.

In mounting the Continental radial Diesel engines, it was desirable to have some form of oil reservoir to carry the lubricant to the engine. A conventional method involved mounting the sump on a hollow base, subsequently filling the base with concrete and grouting the entire unit to a foundation in order to provide a stable mass. Such an arrangement, however, would be inconvenient in that once the unit is mounted it would be difficult to unmount it and the entire installation would lose much of its advantage by taking on a high degree of permanency.

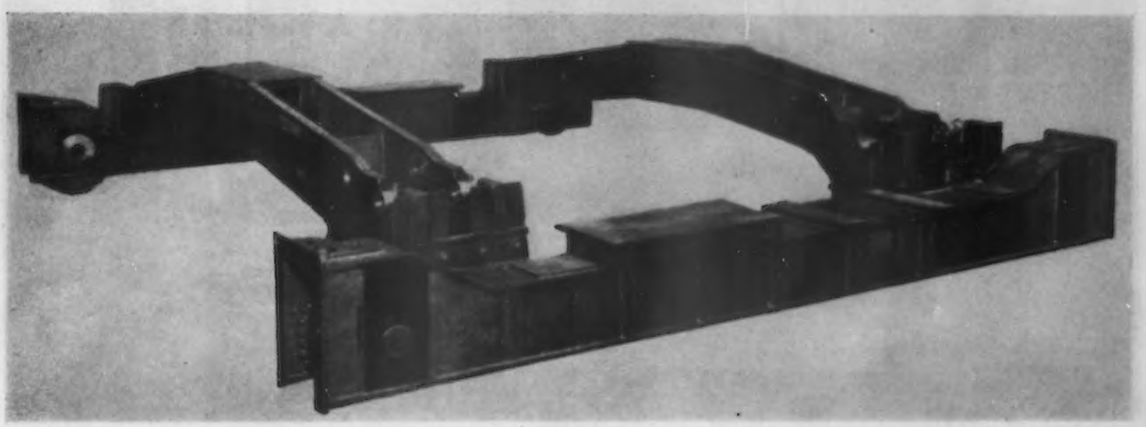
Solution of the problem was found in a combined base and oil sump which weighs 8240 lb. and in which the sump is welded to a steel plate base 4 in. in thickness. The desired mass was thus obtained and the complete assembly of base, tank, engine and generator is then set down upon a nest of springs, giving a floating mounting and preventing any vibration from reaching the building. The unit remains portable, since its mass is movable, and the material used to obtain the mass can be salvaged, because 4-in. plate has a value any time.

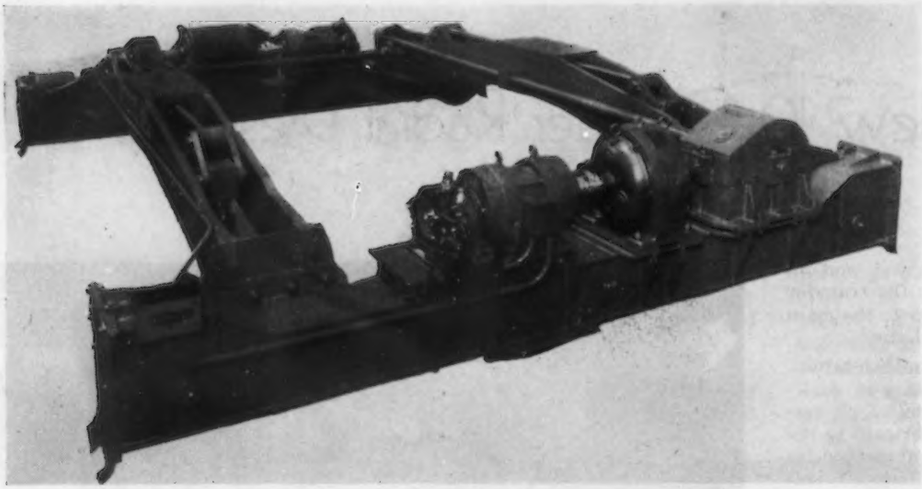
IN the combination oil sump and base, the sump is welded to a steel plate base 4 in. thick.

Soaking Pit Trolley Fabricated by Welding

WELDED steel construction was employed by the Shaw-Box Crane & Hoist Co., Muskegon, Mich., in building the soaking pit trolley shown in the accompanying illustrations. Of 15-ton capacity, this trolley is to be used in a large steel mill for traveling over soaking pits and lifting the covers.

One illustration shows the frame. The arched section is made of 3-in. steel plate. The main girder is of so-called four-sided box construction, utilizing 1-in. flame-cut plate with heavy wide flanged diaphragms inside. These are welded integral with the side members.





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THE arc welded frame of this soaking pit trolley is shown on the preceding page. It is made up of 3-in. steel plate, and the main girder, of box construction, utilizes 1-in. flame-cut steel plate with heavy wide-flanged diaphragms inside. The complete trolley with its high-torque electric motors in place is pictured above.

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The bevel gear box bracket and housing unit is completely welded from 1-in. steel plate.

The trolley is driven by electric motors of high torque with asbestos insulation and slot insulation of mica. The complete trolley with motors mounted in place is shown in the second illustration. The rail gage of the trolley is 17 ft. 6 in.

It is stated that by using the welded construction a strong, rigid frame of light weight was obtained, and the cost of complicated patterns was avoided. The many separate parts of the steel frame are joined into one integral unit without intermediate connecting members. The illustrations are by courtesy of the Lincoln Electric Co., Cleveland, whose shielded-arc equipment was used in the welding.

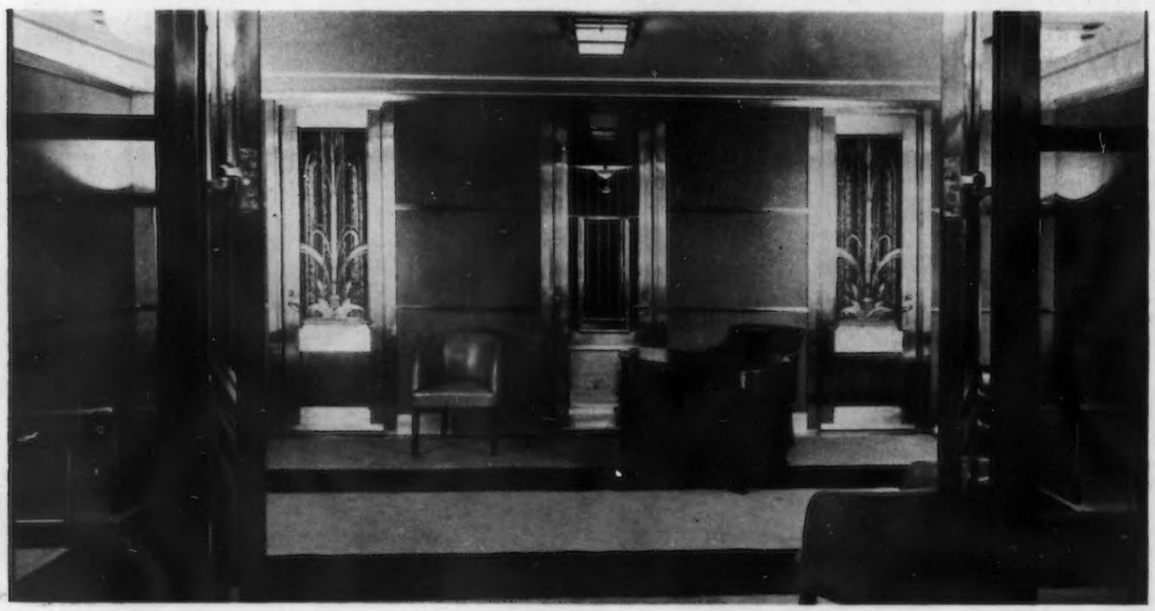
Steel Walls Add Beauty to Republic's New York Offices

IN THE IRON AGE of May 30, 1935, Tom M. Girdler, president and chairman, Republic Steel Corpn., said that "the growing adaptability of steel to new purposes will enable it to supplant other materials in an infinite variety of fields."

As one indication of the "growing adaptability of steel to new purposes," probably no finer example is available than the new New York offices of Mr. Girdler's company in the Chrysler Building.

All of the walls—Masterwalls by Hauserman — including the strikingly handsome entrance doors and lobby, are built entirely of steel.

For many years the E. F. Hauserman Co., Cleveland, creators of movable steel Masterwalls, have concentrated on the idea that walls of steel are not only thoroughly practicable and far superior to various other types of inclosing walls and partitions, but actually are far superior from an investment or cost standpoint.



Steel manufacturers, heretofore, have been rather indifferent toward the unquestionable and definitely proved advantages of movable steel partitions, and many of them even now are occupying office and factory buildings where other types of partition have been used, and sooner or later will have to be demolished at tremendous financial loss to accommodate inevitable rearrangement and changes which will have to be made.

The beautiful entrance door represents the last word in attractive practical adaptation of stainless steel for door construction.

Passing through the entrance door one is instantly impressed with the magnificently executed wall treatment of the lobby. The walls are finished in grained harewood with stainless steel base and cornice, attractively and strikingly set off with horizontal bands of stainless steel around the room.

The rest of the entire suite, seven offices, and conference room, has a grained walnut finish.

The 3 in. all-steel Masterwalls between the various offices are soundproofed rockwool-filled—and are more sound-resisting than a tile and plaster wall of practically double their thickness.

All of the exterior walls are wainscoted in the same handsome walnut grained finish, as are the splendidly executed window embrasures.

As in all Hauserman Masterwall installations, all wiring is concealed within the walls, and yet is almost instantly available for changes or in case of wire trouble.

In the telephone room is a truly unique feature. The new Hauserman Acoustiwall—a steel partition with built-in acoustical treatment—has been effectively used to correct and control the acoustical conditions ordinarily such a problem in interiors of this kind. The Hauserman Acoustiwall is a perforated metal surface backed up with a thick pad of sound-absorbing material. It functions in identically the same manner as perforated metal ceiling treatment. The Acoustiwall, like the rest of the interiors, has a grained walnut finish and the perforations are almost imperceptible.

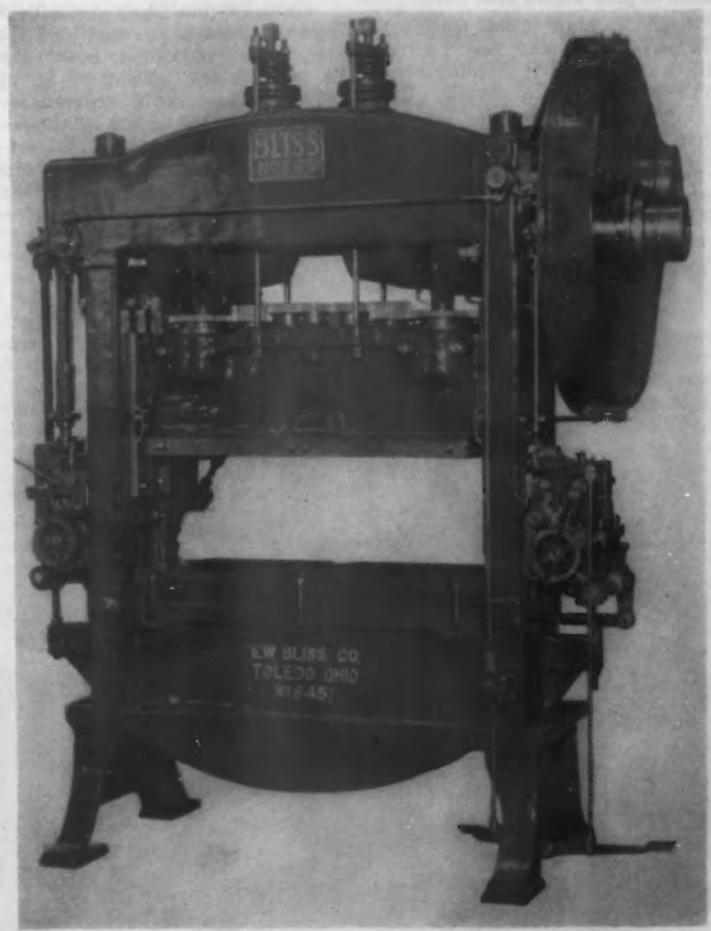
By using steel walls throughout its offices the Republic Steel Corpn. when, as and if it should ever decide to relocate elsewhere can readily—and with no loss whatever in salvage value—dismantle the Hauserman Masterwalls and load them on the moving truck with the rest of its furniture for reerection in new quarters. If tile and plaster or similar so-called permanent walls had been used, when the time came for rearrangement or moving out the walls would have to be completely demolished with a 100 per cent loss in the investment, plus cost of removal of debris.

High-Production Press Suitable for Follow Dies of Considerable Length

E. W. BLISS CO., Toledo, Ohio, has added to its line the high-speed automatic press illustrated, which has a width of 48 in. between housings, adapting it to use of follow dies of considerable length.

The machine is rated from 45 to 65 tons, depending upon the character and duration of the load. It is regularly arranged with a multiple-speed or variable-speed drive for operating speeds up to 250 to 300 strokes per min. for the non-geared machine and up to 150 or 175 strokes per min. for the longer stroke geared machine.

Long die life—a valuable feature where expensive multiple-operation tools are used—is attributed to use of heavy sections, special gibbing of highly accurate type, the double crank construction with heavily ribbed crown, and the shrunk-in tie-rod frame. Equipment includes high-speed type double roll feeds, substantial scrap shear with blade clearance adjustment, spring counterbalance for the slide, and automatic force feed lubrication; also a foot-controlled starting mechanism, which is emphasized as essential for efficient production on strip feeding and as a convenience in starting and restarting of coil stock.



THIS high-speed production press, a patented new design, is adapted for follow dies of considerable length. Long die life is attributed to use of heavy sections, highly accurate gibbing and other features.

Improvements in Production

Both New Design and Improved Models Feature Kearney & Trecker Line

IN the national machine tool industrial activity, for more and better controlled production, Kearney & Trecker Corpn., Milwaukee, has entered the field with 12 new milling machines. In the field of light work 1½ and 3-hp. machines feature rapid production, while 3-hp., No. 2, light, plain universal and vertical tool room millers are provided for the requirements of jobs within that field.

Model K, high speed machines now have front and rear control with a new model H dividing head and new astronomical divider. Hydraulic feed, with two-way cycle is made an optional feature on bed-type machines.

It is announced that practically every machine in the entire line of both knee and column type machines has been either redesigned or supplemented by entirely new models.

The new No. 0, manufacturing knee-type, model H machines arouse interest because of their "Midget" size. The distance from the spindle center to the floor is 3 ft. 8 in. Their utility is for small parts in large quantities.

"Midget" machines are built in two sizes, No. 0, powered by a 1½-hp. motor, and No. 1, powered by a 3-hp. motor. There is an optional power rapid traverse for table, either 150 or 300 in. per min. Characteristic, two steel bar overarms are employed. Both "Midget" machines are equipped with hydraulically controlled screw feed, automatic two-way cycle and automatic spindle stop. Sixteen spindle speeds, of the quick change gear box type with three optional ranges, are provided. Anti-friction bearings are employed throughout.

No. 2, light, high-speed machines, model H, for general manufacture and toolroom service in light operations are powered with 3-hp. motors and are available in plain, universal and vertical types. They have 16 quick-change speeds with two optional ranges. Sixteen feeds have single dial control with three feed ranges.

A new line of model K, high-speed, wide-range, knee-type machines represents an entirely redesigned line. Duplicate front and rear control is provided for both hand adjustment and power feed operation. A new safety feature

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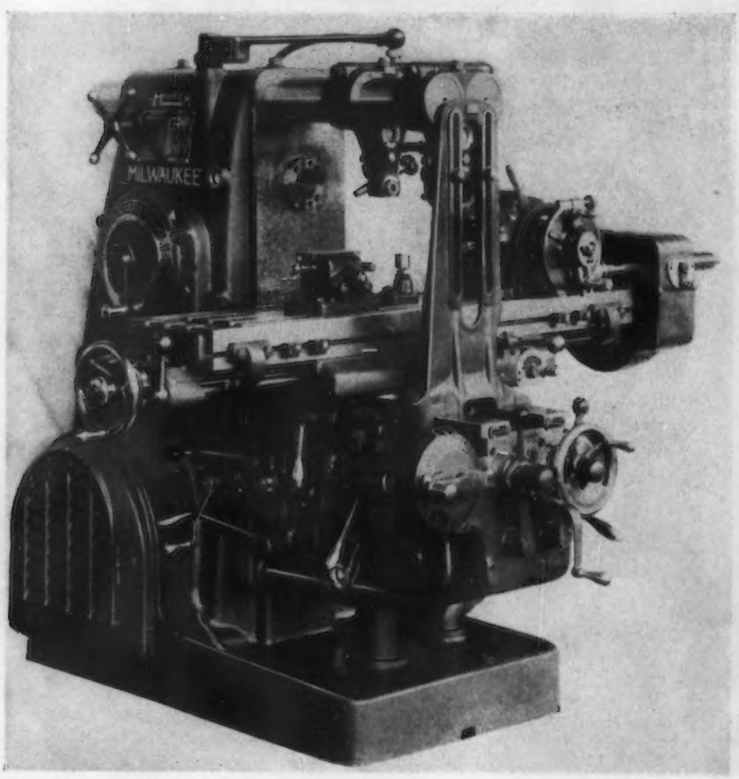
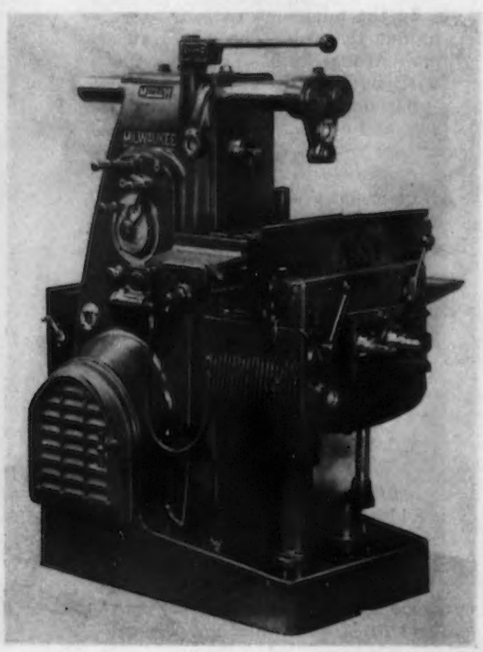




The new "midget," model H, manufacturing Milwaukee miller shown below is for small parts in large quantities. Distance from floor to spindle is only 3 ft. 8 in. The miller pictured at the left, the model K, is a new high-speed, wide range machine featuring front and real control.

and Shop Equipment . . .

provides positive interlock against hand-crank hazard when power feed or rapid traverse is engaged.

Twenty-four spindle speeds are provided in one continuous series in approximate geometric progression without overlapping. Speed selection is made by a single lever and a large direct-reading dial. The lever may be rotated either clockwise or anti-clockwise. The method is selective and not progressive when dropping back to a lower speed. There are 32 feeds in continuous series, obtained by a single lever and direct-reading dial. Feed change can be made while the spindle is revolving. Spur gear spindle drive, with two gears on the spindle, is employed. Drive from motor to initial shaft is by multiple V-belts. The main clutch is located on the outside of the drive pulley and is inclosed. An integrally-cast chip-trough has its position at the rear of the knee permitting chips to drop to the column base. Push button control is positioned on the adjustable starting lever. Duplicate control levers which perform similar service are of like material and shape. Knurled locking nuts are provided for micrometer dials.

The new No. 1218 simplex, bed-type machine is equipped with hydraulic feed, two-way automatic cycle and automatic spindle stop. Table feeds range from 0.0 to 100 in. per min. Feed can be automatically stepped-up or reduced while in cut by means of cams attached to the table. Delayed reverse is provided for milling to a shoulder.

Faster Operating Magnetic Contactors

QUICKNESS of response and more rapid acceleration is claimed for a new line of direct and alternating current magnetic contactors embodying a radical departure from the conventional design and applicable for crane, mill and machinery controllers that has been brought out by the Electric Controller & Mfg. Co., Cleveland. Increase of 35 per cent or more in speed of operation is claimed.

An outstanding feature is the new method for handling the arc. As the contacts start to separate, the arc is quickly removed from the contact tips, one end of the arc traveling rapidly upward along the circular copper guard over the blow-out coil and the other end traveling outward or in the opposite direction along the horizontal arcing plate between the arc shields. The arc is kept moving at high speed and is stretched out in a line midway between the arc shields until it is ruptured. Because of this newly developed method of handling the arc the trade name "Line-Arc" has been applied to the contactor.

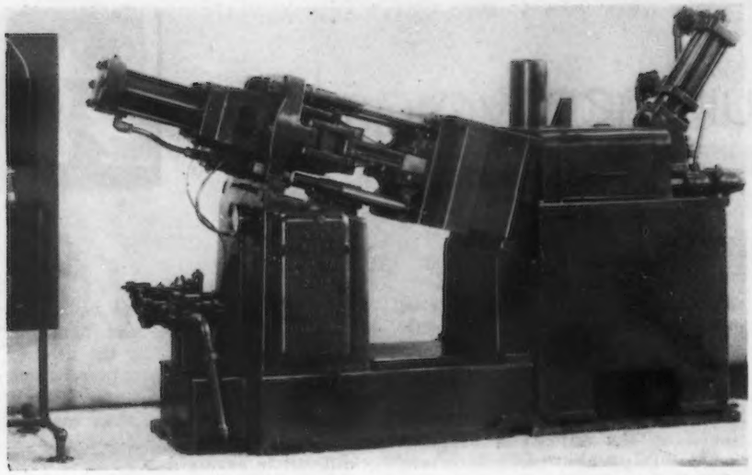
As the arc is instantly removed from the contact tips the latter remain cool, and it is stated that under normal conditions they will never reach the temperature of electronic emission, that is, a condition in which the arc handling surfaces are raised, by the heat of the arc, to a temperature which results in the feeding of electrons into the arc stream, thus making the arc a better conductor and more difficult to extinguish.

The design, it is claimed, results in greatly prolonging the life of the contacts. Consumption of metal from the arcing plate and blow-out guard is eliminated because of the constantly changing terminals of the arc and the speed at which the arc is stretched out along these points. For that reason they should last indefinitely.

Rupture of the arc is clean. By moving the arc at high speed and eliminating the emission of electrons into the arc stream, restriking of the arc with its succession of rapidly occurring sharp voltage peaks to strain the insulation of connected apparatus is avoided. Instead there is only one moderate and rounded voltage peak across the contacts, as the arc is ruptured. Vibration due to the bouncing of contact points when closing or opening the points is eliminated.

The contactor frames are made of strong aluminum alloy, having the advantage of light weight and low inertia of moving parts, which permits quick response and high-speed operation. The bearing pins and bushings are of nitrided steel. The armature and core of the direct current type are made of rolled steel. These parts in the alternating current type are made of electrical sheets. Hardness of the copper contacts has been increased by a special cold forming method providing greater resistance to wear.

INCLINABLE open-back power presses made by the V & O Press Co., Hudson, N. Y., are described in an unusually attractive 25-page catalog designated as the No. 35. In addition to salient construction features, the booklet includes specifications, replacement charts, full-page illustrations of various models, punching and shearing data and a partial list of users. The machines can be equipped with roll, dial, bar and other automatic feeds.



Hydraulic Plunger Type Die Casting Machine

REED - PRENTICE CORPN., Worcester, Mass., has announced a fully automatic hydraulic die casting machine. Provision is made whereby a second operating lever, used in conjunction with an automatic operation lever, permits of manual operation, during which a third lever is removed. One standard Vickers oil pump supplies the hydraulic power. Control valves for both the die cylinder and the plunger cylinder are a Vickers product. Interlocking mechanism prevents operation unless dies are securely closed. An electric time delay relay provides dwell for solidifying period. Die plates are planed on four sides allowing for application of core-pulling attachments. Automatic ejection is provided for through holes in the center of the die plate. The machines are built in three sizes of which the illustration, shown above, is No. 1, having 2½ in. diameter piston and 6 in. stroke.

Plate-Lift Grip for Crane and Hoist Use

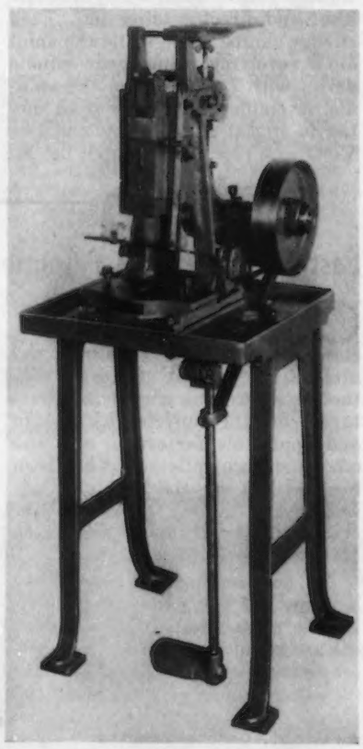
A PATENTED "Grip Lifter," announced by Shaw-Box Crane & Hoist Co., Muskegon, Mich., utilizes an angularly moving wedge member, so designed as to increase grip under emergency load pulls. The lifter is illustrated below. A five-ton lifter has a ⅝-in. throat while 10-ton capacity is indicated by a 1½-in. throat.

In operation the lever serves to raise the angular slide to a position making the full capacity of the throat available. The material to be lifted is then entered in the throat and the lever released and the angular-slide, lower - end roller comes to rest against the material. The lifting movement creates a binding wedge which, obviously, is accentuated by any normal or emergency increase in load which may be developed. Nor can the wedge action be released until the material is brought to rest, permitting that the lever may again serve to raise the angular wedge. Extreme tests are said to have demonstrated the impossibility of releasing the grip by any method other than that of bringing the material to rest on a surface which will sustain its weight.

Bench Power Press Features Safety

A NEW design of bench press, illustrated below, is announced by Waterbury Farrel Foundry & Machine Co., Waterbury, Conn. Its purpose is to perform by power many of the operations ordinarily done with foot presses. The elimination of fatigue as a production factor is contemplated by the design. A built-in safety device is said to be foolproof and to permit of freedom in the use of both hands.

A transparent guard of non-breakable, non-inflammable material automatically swings down in front of the tools when the balanced treadle is swung backward to trip the press. The swinging of the pendulum-like treadle to the rear actuates a special pin-clutch, which automatically stops the press after one revolution of the flywheel. The clutch mechanisms and the guard operating device are so interlocked that the press cannot turn over unless the guard is completely down nor can the guard be



(CONTINUED ON PAGE 75)

Cleveland Sets New "High" in Industrial Convention History

Phenomenal Attendance and Keen Interest of Machine Tool Users at Machine Tool Exposition Presages New Era in American Industrial Efficiency

THE tool builders and the tool users of America are planting a new milestone in the road of progress at Cleveland. The builders are playing their part in the ceremonies by revealing the most impressive display of mechanical improvement and development that mankind has as yet been privileged to see. The users of machine tools, in this country and many others, are doing their part by "saying it with orders," which is perhaps the most sincere tribute that can be paid to real accomplishment.

Attendance records as applied to former machine tool shows or to any other industrial expositions are being smashed to smithereens, in spite of "hand picked" admission regulations that exclude the general public with mere curiosity interest. Every one of the thousands upon thousands who have flocked daily through the doors of the great Cleveland Auditorium to view the new marvels wrought by the minds and the hands of tool designers and makers, has a definite part in the metal-working industry and every one of them contributes, in some measure, to the selection of America's future industrial equipment. The significance is great, therefore, of an attendance which will undoubtedly reach a total of 80,000 for the ten days of the exposition (last Saturday's admissions were 27,000, which sets a record even for the huge Cleveland Auditorium). It means a stimulus to the capital goods industry that will bear fruit for many months to come, and in many directions, through a widespread knowledge of the means now available to reduce costs, improve products, secure new markets and increase profits in our tool using industries.

C. J. STILWELL
President, N.M.T.B.A.

At the exposition there were approximately 250 individual exhibitors of machine tools and accessories and related appliances or equipment. The cost of the exhibits has been variously estimated as between four and five million dollars. The floor space occupied was close to 140,000 sq. ft. and the "mileage" required to make a single "round trip" through the various aisles—not counting detours within exhibits, was 2½. The number of individual machines and items shown was estimated as exceeding 5000. Exposition management was in the hands of Robert Everett Associates, Inc., who handled the previous machine tool show in 1929.

Concurrent with the sessions of the exposition, which officially opened on Wednesday, Sept. 11 and will close this Saturday, were evening meetings of the Machine Tool Congress, conducted by the American Society of Mechanical Engineers, the American Society of Tool Engineers, the Cleveland Engineering Society, the National Machine Tool Builders' Association (sponsor of the exposition) and the Society of Automotive Engineers. The congress was under the general chairmanship of C. R. Burt, president, The Pratt & Whitney Co. Preceding the official opening was a pre-view on Sept. 10, at which, by invitation, several hundred chief executives of industrial, railway and financial concerns attended the exposition and also a dinner given at the Hotel Cleveland by the National Machine Tool Builders' Association. Also preceding the opening, and at the Hotel Cleveland on Sept. 9, was the annual meeting of the Associated Machine Tool Dealers.

The Preview

Tuesday, Sept. 10, the day before the official opening of the exposition, was devoted to a pre-view of the exhibits by several hundred invited guests of the National Machine Tool Builders' Association. The guests, who comprised prominent executives in metal-working plants, railways and financial institutions, attended a formal dinner on Tuesday evening given by the N.M.T.B.A. at the Hotel Cleveland.

Charles J. Stilwell, president of the National Machine Tool Build-

ers' Association, presided at the pre-view dinner, attended by nearly 1000 machine tool builders and guests, and introduced Ralph E. Flanders, president of the A.S.M.E. and president of Jones & Lamson Machine Co., as toastmaster. "We

W. P. KIRK
Chairman, Exposition Committee

rejoice," said Mr. Flanders in part, in introducing the speaker of the evening, "that our industry is the servant of competitive industry. We are convinced that competition of the type which is known and practiced by those gathered here tonight is the kind which permits survival only to those who make more and better goods and who sell them to the public for less money."

Thomas J. Watson, president, International Business Machines Co., was the guest speaker of the evening. As one of America's outstanding users of machine tools, Mr. Watson challenged the popular emphasis which is placed upon mechanization and which is characterized by the term, "machine age." This is a misnomer, in Mr. Watson's opinion, for back of every improvement in mechanization are the brains and experience of men, to whom should go the credit for improvement and progress.

Citing figures of employment in 1890, as contrasted with 1930, Mr. Watson demonstrated conclusively the employment building characteristic of progressive mechanization and that increases in wages as well as shortening of hours have been primarily due to improvements in machinery.

First Session of Machine Tool Congress

Surface finishing was the subject of two interesting papers presented at the opening session of the Machine Tool Congress. P. E. Bliss, president, Warner & Swasey Co., presided at this session, which was held under the direction of the machine shop practice division of the American Society for Mechanical Engineers. Welcome was extended to Ambrose Swasey, one of the founders of the Warner & Swasey Co., whom Mr. Bliss introduced as one who had learned the machinist trade 69 years ago.

In his opening remarks as chairman of the congress, C. R. Burt, president, Pratt & Whitney Co., stated that the scope of the congress, the third to be held, had been extended under the sponsorship of various technical societies. Engineers, he said, were responsible for the success of the machine tool show and for designing equipment to lower production costs and this makes devices available to improve living conditions. The advance in production equipment during the past six years has been remarkable, he declared, and there are now greater opportunities for engineering and research work than ever before.

Surface finishing by cylindrical grinding was the subject of a paper by Howard W. Dunbar, manager grinding machine division, Norton Co. Declaring that mechanical refinement is the outpost of progress,

R. E. FLANDERS
President, A.S.M.E.
Toastmaster, Pre-View Banquet

that the spirit of grinding is accuracy and that the precision of work depends upon the precision of the tool that does it, Mr. Dunbar stressed the important part that grinding has played in the manufacture of improved equipment and to meet the demands for speedier equipment. Grinding machines and abrasives, he declared, have kept pace with the improvements in materials. Materials and grinding have gone hand in hand in the past and this is probably true of the future.

We are on the eve of a revolutionary change in the design of all

C. R. BURT
Chairman, Machine Tool Congress

machinery, Mr. Dunbar predicted. There will be more automatic machinery. Development of grinding machines and abrasives follow the improvement of materials used in construction. He believed that further development of materials will shape and mold the form of mechanical devices.

Speaking of materials of the future, Mr. Dunbar predicted that they would be lighter and of a higher tensile strength. Toughness will be one of their physical characteristics. It is hard to conceive how these improved materials can be fabricated without the use of grinding machines and abrasives, he said.

The speaker stressed the importance of the grinding wheel in improving the construction of automobiles in which limits of split thousandths of an inch have become common and in which some parts are now held to limits of 0.0001 in. Grinding, he said, is responsible for accuracy, smoothness of operation and safety of the automobile.

Precision Boring

Rapid strides have been made in precision boring, declared A. W. Schneider, Heald Machine Co., in a paper on internal surface finishing. Discussing the general subject of finishing internal surfaces he said that a finish and accuracy in holes in commercial production which a few years ago were produced only at high cost in the best

tool rooms is obtainable today with the rapid development of methods and machines. Drilling is still a prime factor, he said, in finishing holes where accuracy is not required. But for holes requiring sized tolerances of less than 0.005 in. some further operation is required. Drilling as a finishing method, therefore, can be used only for clearance holes.

PHILIP E. BLISS
Presided at First Congress Meeting

While broaching equipment has been improved considerably in recent years, Mr. Schneider said it is still very difficult, if not impossible, to broach holes in true relation to another hole or face. On some work it is possible to economically produce holes with a roundness tolerance of 0.0005 in., straightness of 0.002 in. in 6 in., and size within 0.00075 in. Bearizing or the use of hardened members rotating at comparatively high speed and either hammering or rolling the slight irregularities of reamed or bored holes has made considerable progress in fields where a comparatively smooth internal finish is desired. This operation is not corrective of roundness or straightness of a hole, but is primarily a correction of improper surface finish. If honing is to be effective, the size, roundness and straightness should be machined in previous operations, leaving for this method only the final smoothing out of surface irregularities. However, by the selection of proper feed and tool shape, Mr. Schneider said, precision bored holes can approach in a surface finish that of a medium or satin finish in a honed hole, although in some cases it is more economical to use higher boring feeds and add a honing operation for high finish.

Precision boring equipment that was satisfactory was not introduced until 1928 or 1929, according to Mr. Schneider. This method of boring has made rapid progress by employing the tool room practice of having a single point cutting tool for generating a straight round hole or using a diamond or cemented carbide tool for high cutting speed. Vibration in these machines is objectionable and machines are now available in which vibration is eliminated. With tools permitting cutting speeds of approximately 450 surface feet on cast iron and up to 1500 ft. on brass and aluminum alloys, Mr. Schneider said, it is possible now with feeds of from 0.002 in. per revolution up to 0.007 in. per minute to duplicate and in most cases improve the finish obtained by either reaming or broaching without increasing labor cost.

Standard precision boring equipment is moving rapidly forward, the speaker declared, due to the requirements in the automotive, electric refrigerator, airplane and other fields for increased accuracy without increasing costs. Hydraulic control has contributed materially to the efficiency of these machines.

Various improvements in grinding machines and grinding practices in the past few years were outlined. Considerable investigation of measurements of surface finishing has been going on, Mr. Schneider said, but the grading of finish has not yet reached production lines and surface finish is usually determined by visual inspection. He said a scale for measuring finish similar to that for measuring hardness is needed and predicted that such a scale eventually would be developed.

AMBROSE SWASEY
Honored as Dean of the Industry

Mr. Schneider presented the following table showing the comparative limits of finished holes that may be obtained by various finishing methods as a guide in the selection of the proper method and equipment to suit a particular need of accuracy.

A. H. d'ARCAMBAL
Speaker at Tool Engineers' Session

Method	Roundness	Straightness	Size
Drilling	.005	.004	.005
Reaming ...	.0005	.002	.001
Broaching ..	.0005	.002	.00075
Boring	.0002	.0002	.0003
Honing .....See note X		See note X	.0003
Bearizing ...	.0005	See note X	See note X
Grinding ...	.0002	.0002	.0003

X—Dependent on condition of hole from previous operation. Holes honed show approximately the same accuracy as the previously machined holes with a possibility of a better surface finish.

Second Session of Machine Tool Congress

"Cemented Carbide Cutting Materials" was the subject of a paper by Roger Prosser, Thomas Prosser & Son, New York, at the evening session of the Cleveland Section, A.S.M.E., held at the Hotel Statler, Cleveland, Sept. 12, and presided over by James H. Herron, consulting engineer.

Interesting percentage figures of constantly widening use of cemented carbide tools were given and illustrated by charts. The possible simplicity of suitable tool grinding equipment was shown on the screen. The importance of a single person in charge of tool grinding operations was stressed. The advantages of the increased powering of machines, when combined with rigidity, were brought

Glimpse of the Machine Tool Exposition As It Appeared Befo

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THE New North Annex was a humming hive of activity.

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EXHIBITION Hall was chock full of proofs of progress.

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BULK was no barrier to machine tool attendance.

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Before the Industrial Public Stormed the Doors

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ATTRACTIVE displays met the eyes of interested visitors.

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ACTUAL production of parts was the fashion at many booths.

o o o

o o o

THE Arena housed a wealth of accessories, appliances and auxiliary equipment.

o o o

out and a number of foreign machines were shown on the screen as indicating advanced foreign design in these respects. Mr. Prosser particularly called attention to gains available but seldom taken advantage of, through sufficient power for heavy cuts at high speeds.

Hans Ernst, Cincinnati Milling Machine Co., Cincinnati, presented motion pictures taken through a microscope, in collaboration with M. Martellotti, showing the action of a cutting tool in chip removal. The uniformity of chip tendency, in connection with "built-up edges," was illustrated as a detrimental factor against which headway is being made. Slow motion pictures clearly demonstrated the fact that a part of such edges remains with the work piece and is a definite element in roughness of finish. Studies by Mr. Ernst have been devoted to three points: Productivity, finish and longer tool life. The present studies are a continuation of those made and presented by the authors through the A.S.M.E. Special Research Committee on Cutting Metals at the annual meeting of the society, December, 1934.

Third Session of Machine Tool Congress

The third session of the Machine Tool Congress was held under the auspices of the American Society of Tool Engineers on Friday evening, Sept. 13. Presiding over the meeting was R. M. Lippard, president of A.S.T.E. and Detroit manager, the Heald Machine Co. A. H. d'Arcambal, consulting metallurgist, Pratt & Whitney Co., was the speaker at this session. Mr. d'Arcambal dealt with the requirements of tool engineers when specifying and tooling a machine for production. The author, who was president of the American Society for Metals in 1932, has set forth his experience and recommendations with regard to small tools in considerable detail in THE IRON AGE, Sept. 5, page 60, and Sept. 12, page 15.

Associated Machine Tool Dealers

The annual meeting of the Associated Machine Tool Dealers was held at the Hotel Cleveland, Cleveland, on Sept. 9, preceding the opening of the National Machine Tool Builders Exposition. W. F. McCarthy, retiring president, presided. The morning session included a membership discussion of association policies. The afternoon session was given over to reports of various committees and a discussion of Federal Housing Loans and the acceptance of such loans by machine tool buyers.

The evening session developed a discussion of sales tax as it affects machine tool dealers. L. M. Waite, THE IRON AGE, also outlined the importance of the dealer as a unit element of the machine tool industry and stressed the general lack of knowledge as to dealer participation in the industry. August H. Tuechter, president, Cincinnati Bickford Tool Co., Cincinnati, informally presented high spots of his 50-year association with dealer distribution and pointed out definite advantages, concretely illustrated, of dealer representative distribution.

H. H. LIND
General Manager, N.M.T.B.A.

The following officers were elected for the ensuing year: President, Norton A. Booz, Federal Machinery Sales Co., Chicago; vice-president, Harry Barney, Barney Machinery Co., Inc., Pittsburgh; secretary, Charles Sauer, Peninsular Machinery Co., Detroit.

British Steel Setting Records

Britain is now producing 75 per cent more steel than it was three years ago, and 40 per cent more than in the record prewar year of 1913. The output of finished products has increased even more.

Current steel production is more than 10,000,000 tons a year equal to one ton for every four people in the United Kingdom. The average output in the last five prewar years was only 6,636,000 tons.

Aircraft steels of the highest grades and values are in rapidly increasing call. Automobile steels are now in greater demand than ever before. Bridge steel is another line for which there is no shortage of orders. One concern has recently booked contracts for 50 steel bridges.

Another important reason for the growth in demand for steel in Britain is that it is now replacing wood in the collieries. Steel props instead of Scandinavian wood and steel tubs instead of wood have absorbed a great tonnage of steel during the past few years.

The railroads have planned to consume vast quantities of steel in developments and replacements during the next two years. There are 300,000 obsolete freight cars privately owned by collieries and quarries. They are chiefly made of wood, but they are to be replaced by steel cars in conformity with the general policy pursued by Britain's four great railroad systems.

Will Attempt to Unionize Auto Plants

DETROIT, Sept. 17.—The United Automobile Workers' International Union, newly-chartered by the American Federation of Labor, will begin a drive on Oct. 1 to unionize 141 automobile and automobile parts plants, according to an announcement by Francis J. Dillon, president. The aim is to have the local union in each plant act as the bargaining agency for all employees in dealing with the management.

While the Federation is preparing for its membership campaign, word comes from New York of the establishment of a new union known as the Federation of Metal and Allied Unions. This newcomer has extended an invitation to the Mechanics Educational Society, comprised largely of tool and die makers, to affiliate with it. It is understood that the Federation of Metal and Allied Unions plans eventually to affiliate with the A. F. of L.

The Automotive Industrial Workers' Association, under the wing of Father Coughlin, is the subject of attack by the A. F. of L., Mr. Dillon dubbing it a "story book union." Still another group, the Associated Automobile Workers of America, led by Arthur Greer and consisting principally of a group of Hudson workers who broke away from the A. F. of L., has announced its second annual convention to be held in Detroit Oct. 26 and 27.

The National Founders Association will hold its annual meeting at the Waldorf-Astoria Hotel, New York, Nov. 20 and 21.

The Next Step for Business Men

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By ERNEST T. WEIR
Chairman, National Steel Corpn.

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A FEW years ago business men gave little thought to Government in its direct relationship to business, except as they were concerned with imports, exports, tariffs, interstate commerce, or some of the few other business functions in which Government was a major factor. In their relationship to Government as individuals, they thought of it from their viewpoint as citizens, not as it applied to their business. Today, Government is an omnipresent factor. You can hardly turn around without being elbowed by some rule, regulation, executive order, or dictum which you must take into consideration. These things are a dead weight upon the business mechanism, they act as a drag, they slow the normal process of recovery, and anyone who is familiar with the proposed and actual legislation in the recent Congress knows that if the Administration has its way there will be more, not less, of these hindrances. It is painfully apparent to all of us that Government now has its hand *in* business. I believe it is equally apparent that, unless strong, intelligent, and widespread opposition develops soon, Government, of a kind we have never before seen in America, may have both hands *on* business and perhaps on everything else.

You may regard this as an unduly alarming view of things. You may agree with the feeling so often expressed that "such a thing could never happen in the United States." I believe that it *is* happening. We have taken our first steps along the road which other peoples have followed in search of the rainbow only to find at the end no pot of gold, but some form of collectivism and dictatorship. The only sure preventive is for the American people to awake in time to the real implication of what is going on. For that reason, if men such as ourselves could ever have afforded to regard action of Government as something of only academic interest, we certainly cannot afford to now. Common sense dictates that we use every legitimate means at our command to force an overambitious Administration to confine itself to rightful fields of Government and within those fields to use the power given it by the people to build, not to destroy. This must be the next step for business men. The privileges and the obligations of citizenship charge us with a duty, now while we still have the right and the opportunity, to do everything within our power to preserve not only the appearance, but the very fundamental principles of the system which has won for the American people more of the desirable things in life than have been obtained by any other people on the globe in any period.

IN an address before the thirteenth annual convention of the National Industrial Advertisers Association at Hotel William Penn, Pittsburgh, Sept. 18, Mr. Weir warned his audience that Government invasion of the economic sphere has not stopped, and declared that it will be checked only when business men get into politics and "stay in during good times and bad."

Questions That Must Be Answered

I realize that in talking this way I am subject to attack. I can be pointed to as the head of a large business, and therefore, one selfishly anxious to preserve the existing order. I can say to you that in thinking of this matter, in trying to clarify my own thoughts and to establish my own position, I have tried, and I believe have succeeded in thinking of it, not from the standpoint of its effect upon me as an individual, but from the standpoint of its effect upon the general welfare. I have arrived at the conclusion that we are face to face with a situation that warrants any man, regardless of his position in life, in asking himself and trying with all his might to get his own honest answers to these two questions:

1. Are we being driven into a system of government that is alien to the American tradition? and
2. If the answer is yes . . . is this course in the permanent interest of the vast majority of our people?

What is the American tradition? In speaking of it, there is the temptation to go back to original sources, to delve into the deeds, words, and supposed intentions of the men who founded the country. I yield to no one in my admiration and respect for the founders. But I agree with those who say that simply because a group of brilliant men charted a course for this country in 1787, it does not necessarily follow that we must or should pursue that course in 1935. Our reason to guard and to cherish the Constitution is not that it was right in 1787, nor that it was the work of Washington, Franklin and Madison, but that it is founded upon principles of basic truth and national value. Being so, it is as right in 1935 and will be as right in 1987 as it was in the beginning. The Constitution indoctrinates a principle that was our reason for the Revolution . . . our reason to found a new nation. It is the principle that all power springs from the people, and that Government governs only with the consent of the people . . . as embodied in our written charter. Each individual is guaranteed complete freedom and security in the employment of all the industry and talent he can muster in the building of his own career, and is protected in the en-

joyment of the fruits of his labor, even from Government itself. In the mass, individuals appoint Government, not as their over-lord, but as the grounds-keeper, the referee, and the umpire in their game of life.

The Roosevelt Administration departs widely from this tradition. The Administration says that our present system . . . by imputation the *Old* Deal . . . has failed. It says that the system has enabled a few individuals to amass great wealth and great power and to use this wealth and power, alone and in combination with other similar individuals, to solidly intrench their position at a serious disadvantage to the vast majority of our people. As a solution, the Administration demands that *all* power be placed in *its* hands, so that its men of celestial vision, unsullied by the least taint of practical experience, can administer this power with a nicety that will take all of the kinks out of our economic mechanism and bring benefits that will cause the people to dance in the streets with joy. Confusion, inefficiency, and vacillation have been characteristic of many Administration actions. But in one line of action and policy there has been none of these. With unswerving purpose, it has driven straight toward its goal. That goal is the concentration in the executive branch of the Federal Government of complete authority over every economic pursuit.

How Atmosphere of Crisis Stifled Criticism

This Administration came into being in the midst of a crisis. Confusion and low morale were manifest in all groups and in every part of the country. There was need to combine the physical and financial resources, the brain and man-power of the United States behind a leader who could act with speed and decision. The immediacy of the problem did not allow for debate and deliberation. No one could question, then or now, the advisability of assembling that vast power nor the manner of its use during the very brief period of that acute emergency. But with the end of that crisis, and it did end quickly, there was no indication of any intention by the Administration to return that power to the people and to take up the normal, customary governmental processes. Instead, the Administration followed a course that was designed to augment and to extend that power. An emergency atmosphere was maintained. Congress became a "rubber-stamp," and ground through a steady stream of "must" legislation which few of its members understood or had even read. Bureaus and departments were mobilized until Washington took on the appearance of a war-time capital. Lieutenants of the New Deal, flushed with unaccustomed authority, assumed an attitude of "Theirs not to reason why, theirs but to do and die."

Very early, some people began to sense that there was something wrong in this drama of Government as it was being enacted by the New Deal. Opposition developed. But the grandiose promises of the Administration had fired the imagination of a depression-ridden people. Any one who spoke against acts of the Administration, no matter how impractical or dangerous they might be, was assumed to be opposed to the supposedly noble motives of the acts and therefore was branded as a reactionary, tory, or worse. It is not strange that in such an atmosphere, opposition was scattered, apologetic, always directed toward specific acts instead of general principles, and that the sway of the Administration increased until, in final absurdity, it was considered "unpatriotic" even to criticize its actions. This was a bad thing for the country. It is a hopeful sign, and a sign of returning vigor and health, that once again, men are fearlessly and openly voicing their convictions.

Policy of Centralization Not Temporary

But if you are inclined to believe that this assumption of unquestioned power by a small group was a passing thing made possible only by the unique circumstances of a particular situation, rest assured that there are others who do not think so. It is true that growing opposition to rashness and speed has been focused upon Congress and has had some slight effect. It is also true that the Constitution has stood as a barrier to the conversion of intentions into accomplished facts. However, these things are taken by the Administration, not as a warning that a large section of our people are out of sympathy with the New Deal program, nor as a mandate to fit the program to American principles. They are regarded merely as impediments that delay and that necessitate a more circuitous approach, but that do not halt the march toward the New Deal goal of centralized power. I believe that mention of a few of the more prominent factors in the present situation will show the logic of this conclusion.

First. What has been the character of the men who have figured most prominently in the New Deal? President Roosevelt's closest advisers have been the Tugwells, the Richbergs, the Wallaces, and the Frankfurters. All of them belong to the allegedly liberal school of thought and are men of theoretic background. In one way or another, they have expressed the belief that a system of individual freedom and independence cannot work under modern conditions. Not only has the counsel of practical men remained unsought on economic problems, but a definite spirit of antagonism has been evidenced toward them.

Second. What has been the attitude of New Deal leaders? The constant theme in both official and unofficial utterances has been the need for fundamental change, a different approach to our problems, a new order. That the desire is not for a change in the application of methods under existing principles, but for a substitution of new principles, is clearly shown, it seems to me, by many examples which are typified by the President's urging Congress to pass legislation *despite* doubts as to its constitutionality.

This attitude has been tangibly expressed in the preparation of legislation and in the type of the Government's defense of legislation in the courts. It is common knowledge that the limitations of the Constitution are regarded as the real stumbling block in the way of the Administration's program. The chief efforts of the New Deal legal staff have been directed toward finding some technical route around Constitutional bars that would comply with the letter, but ignore the spirit of that document.

Third. The proposed and actual legislation in the recent Congress was a continuation of this trend. In the mass, this legislation affected many different groups and functions in our economic system. Examine any individual piece of legislation and you will find that it does two things: It first offers some great new boon to some particular group and therefore is calculated to win the allegiance of that group, and then it gathers some new and great power into the hands of the Federal Government. Consider just a few:

How Government Is Invading Economic Sphere

Conceived by the American Federation of Labor, and jammed through as a weapon to force the total unionization of industry, the Wagner bill was ostensibly designed to give labor the right of collective bargaining a right it has always had and exercised. If constitutional, the Federal Government, for the first time, will have complete control over all employer-employee relationships. The Guffey bill is designed to stabilize the

bituminous coal industry, yet it is almost certain to raise costs and give an advantage to competing fuels. A producer has the theoretical right to operate outside of this law, but over his head is a taxing provision that will ruin his business if he fails to comply. If constitutional, this law would place the coal industry, and by application of its principle, every other industry under control of the Federal Government. Under the AAA, one man, the Secretary of Agriculture, has sole authority to determine the kinds and amounts of farmers' crops. He can tax handlers of agricultural commodities, and turn the tax funds over to the farmers, thereby determining how much farmers shall receive . . . and by the same action, how much housewives shall pay. This law places economic power over a large and important group of our population in the hands of the Federal Government.

The TVA has been described by Norman Thomas, who ought to know, as the purest example of socialism in the United States. It gives the Federal Government the dangerous weapon of public competition with private enterprise. The tax bill was forced through a reluctant Congress not to produce revenue, but to punish "bigness." It was a flagrantly improper use of a legitimate function of Government, undefended even by ardent Administration supporters. It affects only wealthy persons and investors, but if its principle stands, what can prevent the Federal Government from using this new power to "punish" any other group or "class"?

Other instances could be cited, but you are as familiar with them as I am, and they all support the same conclusion. Whatever their motives, leaders of New Deal thought believe that the American tradition of individual freedom, self-dependence, and responsibility must be fundamentally changed; they believe that this change can be made effective only by a reduction in the power now vested in the people and a corresponding increase in the power of the Federal Government; they already have taken steps to accomplish this purpose, and despite all setbacks, they continue without deviation toward their goal of centralized control.

Present System Has Not Failed

In order to give the Roosevelt Administration any just basis for its actions, it is necessary to concede that our present system has failed. I, for one, do not concede this. It is easy enough to give our system a bad name if you view it, without perspective, in the light of admittedly adverse present conditions, or if you compare it with a Utopian "Planned Economy" that is the product of wishful thinking and has never been realized anywhere in the world. Also, it is easy enough to inveigh against our system if you add up only its evils and ignore the facts that these evils are not new, being traceable throughout the history of man, and that our system is the producer of benefits for all individuals that far outweigh the sum total of its occasional evils.

Granting every black mark that can be chalked up by the impatient idealists against the traditional American mode of life, these things remain true. The guarantees of personal freedom, political equality, and protection in the right to earn and to hold property attracted millions of people from other lands. Our system inspired men and women to brave all the dangers and hardships of pioneering and settling a wilderness because they knew that whatever they wrested from nature would be theirs. It encouraged a flowering of inventive and organizational genius that has never been witnessed anywhere else. It imposed no barriers that any person, however ill-favored his beginning, could not surmount to reach the highest positions in the country, and we have the examples of thousands who became leaders with no other aid than their own natural ability and industry, and of millions who have attained comfort and security.

What America Has Attained

Our system has resulted in the diffusion of the material comforts of life so broadly and generously among the people that our general standard of living has long been the envy of other peoples. This is pointedly illustrated by some facts which were gathered by C. L. Bardo, president of the National Association of Manufacturers, who will follow me on this program, and who may give you more detailed and interesting information on the subject than I can. The United States has only 7 per cent of the world's population and about 6 per cent of its area, yet it has 58 per cent of its telephones, 36 per cent of its developed water power, 32 per cent of its railroads, 76 per cent of its automobiles, and 44 per cent of its radio sets. We produce 60 per cent of the world's oil, 48 per cent of the copper, 43 per cent of the pig iron, 47 per cent of the steel, 58 per cent of the corn, and, prior to the AAA, 56 per cent of the cotton. In 1930, 14 million families owned their own homes; more than half of our farmers owned their own farms. A measure of our standard of living can be found in the fact that, as a people, we consume more luxuries than other peoples. We spend more for educational and cultural institutions, hospitals, and churches. We have more bank accounts and insurance policies in force. These things do not indicate that only a few are favored, but that the average of general well-being is high.

Although comparable figures could not be found in any other country, they, by no means, are cited as a reason for a complacent acceptance of existing conditions. They indicate merely how far we have come, and how deeply the vast majority of our people have shared in the general progress of the country. They are not given as a final answer to our problems, nor as a denial that there are social inequalities, injustices, and maladjustments in our system that will certainly bear correction. But they do represent the farthest present material reach of civilization, and they are the direct product of the system of government which we have had from the beginning and which is now under attack.

Material progress, now as always, depends upon increasing production and wider distribution of goods. This production and distribution has been stimulated more under our system than under any other evolved by man. Our best hope of progress is not in the overturn of this system, but in its maintenance and operation to encourage a larger expansion and greater development of industry. We know this system, we have seen it in action through long years, and we have seen it produce a real and a recurring New Deal for each succeeding generation of Americans. We need ask no questions about *it*, but certainly wisdom dictates that we ask many searching questions about this new thing that is being offered us . . . particularly when what we have been allowed to see of it thus far, indicates that it proposes to achieve its great advance in human well-being by methods that are a throwback to the very conditions of autocratic power from which our forefathers fled to the wilderness of America.

The Real Implications of the New Deal

What are the real implications of the actions of the Roosevelt Administration? One of its basic positions is that, under our present economic system, business men have the freedom to determine their own economic actions, and that since each strives for his own gain, supposedly regardless of the general welfare, he causes dislocations which eventually break down our

economic machinery. With sufficient power, it is assumed that Government could place check-reins upon business that would keep it on the track.

It is apparent that Government could do this only if three things were true: *First*, it would need to have a personnel with an economic intelligence superior to the combined intelligences of business men throughout the country. *Second*, these officials would have to be motivated by considerations in which personal, social and political influences played no part. *Third*, Government power could not be confined to the economic field, but would have to be extended to every other field and over every individual in the country.

What evidence have we ever had of such superior intelligence in Government? It is a commonplace that with complete power in its own field, Government has never been able to run its *own* machinery with anything approaching the efficiency and economy of a business organization. It is preposterous to suppose that any small group of men can sit in Washington, survey the whole complicated industrial and business system of the United States, determine just which parts are out of alinement, or getting out of adjustment, and tell business men exactly what to do about it. There can be only one result. No small group of officials can administer this power. They must distribute it among a horde of Government underlings who would infest every mill, factory, and office in America. These men, unrestrained by the personal responsibility to stand a loss which is a constant check upon men in private enterprise, could readily pass the cost of blunders and inefficiency along to the taxpayer. If you wish to get a mental picture of the result, just multiply by 10 or 20 the effects of some of your own experiences with the alphabetical bureaus already functioning. The net result would be the creation of a bureaucracy that, by comparison, would make the present teeming offices in Washington look uninhabited.

Such a system would be very definitely a Government of men, rather than of principles. Business continuously would be subjected to changes of governmental methods, regulations, and minds. Stability would be a minus quantity. Confusion, hesitancy, lack of initiative would brand every business action. It is futile to expect that the conduct of office holders in business and industry would be any different from their usual conduct in politics. Their every move would be dictated by the natural human desire to hold a job and if possible to increase its importance. The actual result of giving Government this power over business would be, not to improve business, but to throw it into politics and to subject it to all the obliquity, inefficiency, and pork-barrel tactics that are characteristic of politics. Because business has been so productive, the country has been able to stand the waste and expense of these things in Government. If we allow them to be imposed on business also, our economic system will have a double burden of dead weight which I doubt that it can carry.

Economic Nationalization Destroys Freedom

The increase of Government power could not be stopped with its extension over the economic phase of life. Inevitably, it would spread until every phase was under its control. Inflation of power is like inflation of currency. If inflation of currency could be stopped at the precise point where money values equaled commodity values, little harm would be done. But there has never been a single instance where this has occurred. Wherever money inflation has been tried, it has escaped the hands of its manipulators and ended in a runaway situation that ruined all values. The inflation of power has been the same. Wherever a Government has undertaken to direct the economic machinery of its country, it has found it necessary to control the kinds and volume of agricultural and manufactured products. This is the first invasion of personal liberties. Others follow. As Government has all power, it has to accept all blame for its mistakes. Opposition develops, and to combat it, freedom of the press, freedom of assembly and speech, freedom of worship, and all the other customary privileges of a free people are thrown out of the window.

These things are not conjectures. They have actually happened in other countries within our own time and experience. A number of European countries have adopted the expedient of trying to solve their economic problems by taking their economic machinery out of the hands of individuals and giving that job to the Government. Russia, Italy, and Germany are the outstanding examples. It is immaterial just what kind of centralized power we are headed for in the United States — communism, fascism, or some other form of "planned economy." I am convinced, however, the steps already taken by the Roosevelt Administration, lead in that direction. Whether we follow the road to the same tragic end that other peoples have found, is a decision that must rest with the American people.

Washington Is Brake on Recovery

The Roosevelt Administration is exerting an influence against the best interests of the country, not only in this leading away from American principles, but also because these same actions delay real recovery. Were it not for this attitude of the Administration, I would have every confidence in the immediate future. The forces of recovery are evident throughout the world. I am positive that the United States would have been much further along in its upward climb, had it not been for this oppressive governmental influence that confused business men and undermined the confidence in the future which is an essential to sustained, genuine improvement.

These actions are uninterrupted, and they continually push back the day on which the last of our millions of unemployed can forsake leaf-raking for honest-to-God jobs in industry. These actions not only are harmful in the present, but will exert a baneful influence far into the future. The Administration is dancing today; we and our children will pay the fiddler tomorrow and the day after, and the day after. By the end of next year, the New Deal will have cost the nation a sum of money that exceeds the total spent by all other Administrations from Washington to Wilson, inclusive. When recovery finally comes, no matter how good it may be, it will be more shallow because of this spending. No matter how much any of you may earn, you will have less to save and to spend upon yourself and your family because of the taxes that will come out of your pocket to pay for the present fling at the "abundant life."

A Time for Effective Action

But neither the impediment to recovery nor the amassing of debt is the most alarming problem. If we hold fast to our proven principles, we will recover, and we will earn enough money to pay our debts. If we depart from these principles, we necessarily leave the road that made the country great and its people the most prosperous in the world. This being so, the big question is what are you and I going to do about it? To make speeches or to hear speeches is not enough. Both are meaningless and futile unless followed by constructive and *effective* action. Eventually a majority of our people must participate in such action, but it is unlikely that general participation can be expected until the principles of this action are brought into sharp focus before the people by a

strong, courageous leadership. In the meantime, business men have the opportunity and the obligation to perform a patriotic service by upholding the tried and accepted principles of the traditional American system, by pointing out how the Roosevelt Administration is departing from those principles, and by using their influence to the utmost to compel a proper regard for their Constitutional duties on the part of elected officials.

The character and performance of the present Congress is partially the result of not *doing* these things. The Congress, not the Administration, presents the most amazing scene in the current spectacle of Government. Any Administration could be motivated by a political viewpoint in conflict with our principles of Government, and try to impose this viewpoint upon the country. This fact was recognized in the establishment of our Governmental mechanism; it was the reason for three branches of Government, each with its own functions, and each a check on the others. This Congress forgot, did not know, or ignored its sworn duty under the Constitution. With abject servility, it surrendered its right *to make the laws*. Without giving decent time for consideration or debate, it allowed one man to tell it what it MUST pass. Apparently it thought it was there to preserve the appearance of things, and to give a legal stamp to extra-legal proceedings. Docility was so much the normal thing that when one of the few men who can be truthfully called a statesman, Carter Glass, made a real fight for principle in the Banking Bill debate, it was almost a case of "Man bites dog." Even the most ardent Roosevelt supporter would hardly claim that the people of the United States elected the present Congress simply to give its members the ride to Washington. There is no greater responsibility than the making of laws that affect the lives and fortunes of millions of people. There is no single thing more important to the country than the character and ability of the men who make those laws.

Business Men Must Get Into Politics

It is with Congress that business men have their first and best opportunity to do something about the present situation. Congress is the branch of Federal Government closest to the people, and most responsive to the people. It also is the branch which is best equipped to check a wild Administration and to start a return to normal conditions. The quickest solution will be to let Congress know that the country wants it to stand on its own feet and to act on principle. When a congressman does act as a statesman, we should not let him feel that he is waging a lone fight, but communicate our encouragement and endorsement of his stand, and support him before his constituents. That this can be effective was demonstrated, slightly but significantly, by the response of the recent Congress to widespread or organized opposition to a few measures. It will be more marked if business men recognize and use the legitimate and powerful influence that is in their hands. Every businessman has standing and influence with a wide group of people . . . with his stockholders, his associates, his customers, his friends, his whole community. If he has a worthy case for or against any man or policy, if he clearly states that case, and if he suggests practical action, he will not fail to secure the cooperation of many of these people that he influences directly, and through them, many others.

But the mere exertion of influence upon the present Congress is not enough. What is needed is a continuing, day-by-day interest in Government on the part of business. By interest, I do not mean the narrow, selfish interest in some immediate advantage, or interest in some specific legislation; I mean a determined interest that *all* legislation shall be in accord with sound principle. This type of interest will be to the advantage of the entire country. There is only one way to get this approach to law making and law enforcement. That is to elect men who have the intelligence to know principles, and the ability and *courage* to apply them against any dictates of political expediency. The only way to insure this is to see that the right kind of men run for office and are elected. As business men we pride ourselves on efficiency; we think we know the requirements men must have for their jobs. Yet in Government—where lack of ability and intellectual honesty can undermine our entire economic structure—we do little or nothing to see that we get men of at least the minimum caliber that we would accept in our business.

If we are going to avoid a repetition of the present mess, we are going to get such men in Government. *We* are going to get into politics, get in with a vengeance, and stay in during good times and bad. We cannot afford to regard such action as a profitless use of time, to pride ourselves on "keeping out of politics." The thing we must do is to bring all of our influence to bear on our political parties, let them know that we will stand only for men capable of bringing to governmental office the ability to govern, and the will to govern justly. We must let slate-makers know that we are completely uninterested in the backing and filling of so-called political strategy. When men are nominated, we must find out who they are, what they have done, and what they stand for. We must support the good ones with every ounce of influence we can bring to bear, and do whatever we can to defeat the other fellows. This is the practical way to get sensible and efficient Government. If we had tried it long ago, we would be much better off today. There is no profit in tears over spilled milk, but with the lessons of unchecked political opportunism before us, we will have little excuse for complaint if we don't do something now, and keep on doing it.

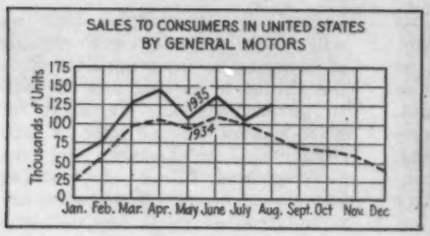
The actions of our present Government and the attitude of our present officials have been good things . . . *provided* we want a taste of the same medicine that has been given to other and less happy countries. If we don't want this, my final word is an exhortation to get busy. May your guiding thought be a determination to preserve those principles which have enabled you to win and to hold your own position in life, and which still afford the best opportunity for your children and all other children to have the advantages we have always considered natural and right under the American tradition.

Trade Convention At Houston, Tex.

PLANS are well advanced for the annual convention of the Foreign Trade Council, at which 1500 delegates from all parts of the country are expected to be present. The sessions will be held in the Rice Hotel, Houston, Tex., Nov. 18 to 20.

Armco Resumes Common Dividends

THE American Rolling Mill Co. has declared the usual dividend of 1½ per cent ($1.50) on its 6 per cent preferred stock and also a dividend of 30c. a share on its common, both payable Oct. 15 to stockholders of record Oct. 1.



THIS WEEK ON THE

Parts Production Quickens as Car Makers Delay Assemblies

DETROIT, Sept. 17.

CAR manufacturers have been accustomed to getting into production on new models with exasperating slowness, but, once under way, expanding their volume with almost incredible speed. This year the industry has not been entirely able to break away from this long-standing habit. While delays in getting the production machinery to work smoothly are not so serious as in past years, nevertheless they are of sufficient magnitude to make operating officials a bit jittery.

Reasons why manufacturing wheels are turning slowly vary with individual makers. In several cases companies miscalculated the time needed by equipment builders to fill orders. Deliveries of machinery no longer can be made in three or four weeks, a fact which some disgruntled car factory executives have lately learned. If orders had been placed a few weeks in advance of their actual receipt, these executives would have saved themselves much worry.

Die tryouts, as usual, have developed trouble for a few companies. An independent car maker, for example, has found that its front fender design for 1936 called for too deep a draw for 19-gage sheets and has modified its dies to make the stamping requirement a little less severe. In several instances it is believed that automobile companies are deliberately moving slowly so as to give dealers a chance to liquidate stocks of current models.

Unexpected Delays

To be specific: Pontiac, having met with unexpected delays, is just starting the manufacture of parts and will assemble only a small number of cars before the month is ended, whereas, if its program had gone through on schedule, it would have produced probably 6000 cars in September. It will not experience any trouble in securing bodies, however, since the Fisher plant at Pontiac is well along in its 1936 operations. Plymouth the past week ran a few pilot cars along its assembly lines to see that everything was in readiness for volume production. Assemblies will start in another week.

Ford is not snapping into work on its new jobs so fast as anticipated, but should be well into 1936 production shortly. It already is understood to be shipping V-eight motors and other parts for the new jobs to branch assembly plants. Ford tentatively is believed to be planning on 70,000 cars for October. At least it will have satisfactory stocks in dealers' hands by show time. Malleable foundries are reported to have increased their melt to take care of recent Ford releases.

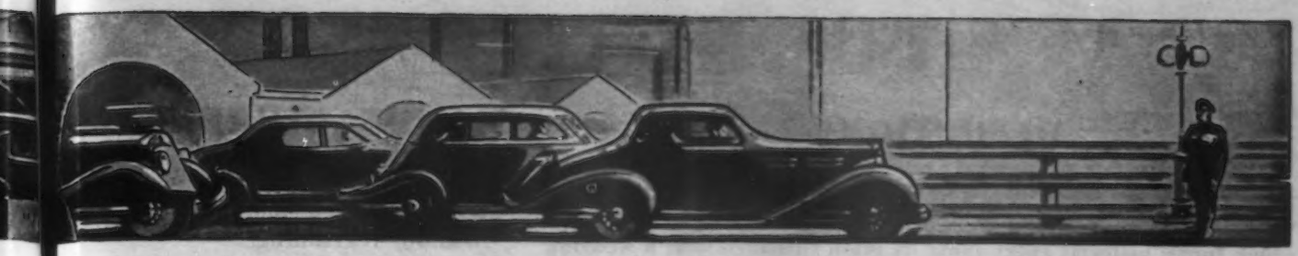
Hudson, having sold 6321 cars in August, probably won't be in production of new cars until around Oct. 1. As optional equipment it is said that both the Hudsons and Terraplanes for 1936 will have aluminum cylinder heads instead of the present alloy cast iron. Both lines will have a one-piece steel top, Hudson having decided to follow more along the pathway of Fisher Body than Nash in the manner of making steel tops.

Buick Set to Go

Buick, imbued with more spirit than it has shown in years, is climbing down off its conservative perch to give its General Motors companions, Oldsmobile and Pontiac, a run for the 1936 money. Harlow H. Curtice, Buick's president, states that the new line has been designed "to take Buick out of the utility class and put it in the smart style class." Buick figures that retail car sales in 1936 will increase 20 per cent over this year's volume and that it should get a bigger slice of the market than heretofore. It is setting up a stiff quota of 135,000 cars for next year, a 50 per cent gain over the 85,000 cars which it will sell in 1935. To get off to an enthusiastic start, Buick has had all of its dealers, distributers and field men, 3000 in number, at Flint for sales meetings for the first time in five years.

Buick's big drive seems to be part of a well-planned program inaugurated two years ago by General Motors to rehabilitate its various car divisions. In 1934, Oldsmobile received special attention, both its personnel and its line of cars having been overhauled completely, the result being that its sales doubled that year. This year Pontiac, again entering a six as well as an eight in the passenger car field, flashed ahead with its Silver Streak car to a volume rivaling its all-time record. Buick now looms as the General Motors prize entry for 1936. It is whispered in well-informed circles that Chevrolet will draw major interest in 1937, with a complete restyling and new engine.

For several years Buick has been faced with two problems. One has been to get a series of snappily-styled cars, including a line considerably under $1,000, which would sell well enough to utilize



ASSEMBLY LINE

most of its enormous plant capacity at Flint. The other has been to pull in enough work from other General Motors divisions to occupy the extra factory space available and then coordinate all manufacture on an economical basis. This has been a job well suited to the talents of Mr. Curtice, whose training has been in cost accounting. No details of cost are said to escape his vigilant eye.

Buick's 1936 series will include four lines of cars, as at present. They will have hydraulic brakes, turret top, knee action, no-draft ventilation and aluminum pistons. Engine power has been increased to give better getaway and better sustained performance on the road. The radiator grille is a zinc die casting. In outward appearance the new Buick has the earmarks of other smart General Motors cars —fenders which hug the wheels, divided windshield, deep sheet metal skirts and more sweeping body lines. It will be publicly shown on Sept. 28.

Dodge to Announce Soon

Early announcement of the new Dodge is indicated by the fact that a dealer meeting and a "preview" of 1936 models are scheduled for today. Packard likewise will hold its annual dealer sessions in Detroit the coming week. Changes in the 120 car are minor, production having been resumed after a short shutdown. Chevrolet has not altered its course of beginning assemblies of new cars the final week of September, with 40,000 cars to be built in October, 90,000 in November and 90,000 in December. Major changes are hydraulic brakes and aluminum pistons. Styling will be much the same as at present, except for a few shifts in front-end design.

While mystery shrouds the new Lincoln, it appears that it will be radically streamlined, with a sweep at the rear much like the Chrysler Airflow. The body will be wide and running boards narrow. It is likely to mark a startling forward

BY BURNHAM FINNEY
Detroit Editor, The Iron Age

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step in Ford design. Bodies will be made by Briggs and it is not unlikely that ideas have been borrowed from the Briggs "dream car," which was displayed two years ago at the Ford shows in Detroit and New York and later at the World's Fair. If a radically-styled Lincoln should catch the public's fancy, the next step probably would be to adopt the design for the Ford, possibly in 1937. That Dearborn is sympathetic to the general style trend is shown by Edsel Ford's recent statement on the Pacific Coast that the next major change will be to put the motor in the rear, where it logically belongs. The automobile industry has learned from experience, however, that the public rebels if it is asked to swallow too big a style dose at one time.

Auburn to Offer Diesel Car

Auburn, searching for something sensational to recapture public interest which has languished for the past four years, will include in its 1936 line a car powered by a Cummins Diesel engine. It is reported that the cylinder block for this car will be made of aluminum and pistons of cast iron, thus reversing normal procedure. It is understood that the Diesen engine to be used in this passenger car was originally designed for light trucks. Auburn's plan appears to be largely a stunt performance from which it will gain much publicity. The factory, it is said, will make the Diesel-engined car only on special order from retail customers, dealers not stocking it. This means that whatever volume Auburn hopes to obtain the coming year will be with its regular line of cars.

The larger-volume car manufacturers, observing Auburn's action, are no more convinced than they were of the feasibility of Diesel engines for passenger cars. General Motors, for example, is said to be of the opinion that they never will be adopted for general use unless many practical changes in design, not now foreseen, can be made. Diesel-engined automobiles have made far more progress in Europe, where they are widely employed in trucks and buses, than in this country.

While car assemblies lag, production of parts is proceeding at a brisk rate. Ford, General Motors and Chrysler are attempting to pile up backlogs of parts to take care of the rush when assemblies are stepped up. Chevrolet has proceeded with its program for acquiring warehouse space around the country to store parts, to be used by its branch assembly plants. While this action is ostensibly to stablize employment by building parts in winter months in anticipation of peak spring operations, it also is to provide a reserve stock to draw on in case union labor should attempt to tie up production by means of a strike.

Steel Releases Heavier

Automotive steel releases increased in volume the past week. Chevrolet ordered sheets for delivery at Flint, and Chrysler made additional commitments. Ford, however, will not be in the market for steel until after Oct. 1. It is said to have large stocks of billets and bars stored in the yards at Rouge. Latest reports are that Ford's new continuous strip mill will be ready about the middle of October and the cold mills 30 days later. Some mills which have been holding flat-rolled steel already rolled have received shipping instructions from motor car companies.

Automotive foundries have taken 20 per cent more pig iron in the first half of September than in the comparable period of August. A number of consumers, which lately have been taking iron as they need it without contracting for it, are signing fourth quarter contracts.

TURNING

DEFINITION

Turning is sometimes, but incorrectly, spoken of as metal cutting which implies an actual shearing action as distinct from "splitting" which forces material apart along its grain structure with a wedging action and which is likewise distinct from sawing, in which the particles are actually pushed or wedged off. Single point tools act in this wedging manner. The chips from such tools are a series of pieces scraped or wedged off the main body and are badly deformed and crushed. A scientifically built cutting tool should on the other hand be so constructed that it would act as a plow shearing the metal chip from the work and push it to one side, allowing the cutting edge to advance relative to the work. When this condition obtains, the cutting angle should be such that the chip slips instead of crumbles, and flows from the work in a continuous, spirally-wound ribbon.

MANUFACTURING REQUISITES

1. Length of tool life without regrinding.

2. Maintenance of smooth surface finish and accurate dimensions.

3. The economical removal of a large amount of material in a short time with the least consumption of power, and without sacrificing tool life and surface finish.

ROTO-BROACH

TRADE MARK REGISTERED

A METHOD for MORE EFFICIENT PRODUCTION

Subjection of the work while rotating at cutting speeds to the action of the tool, the blade edge or edges of which are arranged to approach the work surface (either internal or external) at an angle with respect to the axis of the work and at a relatively slow speed so that the cutting action passes along the blade from point to point axially of the work and so that no one point of the blade is subjected to a continuous strain or a continuous heat for an excessive time interval. This is Bullard Roto-Broaching.

RESULTS

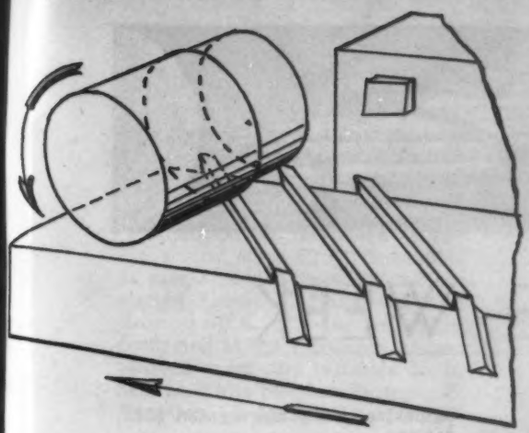
By the use of this type of tool, it is possible to provide maximum tool life, since the burden on each blade may be relieved by the fact that the work is being operated upon by as many roughing cutters as may be required, and as many finishing cutters as maybe required, all in a single pass of the tool. No one blade will thus be subjected to continuous action or over-burdening by too deep a cut. Furthermore, from a single chucking of the work, the tool will operate to both rough and finish the work at a single pass of one tool block.

PRINCIPLE

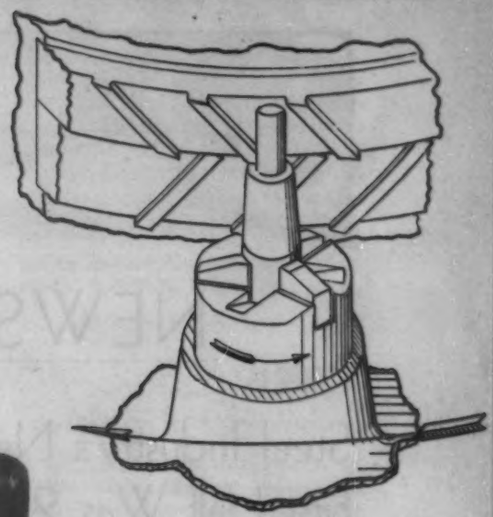
In some instances the ROTO-BROACH cutter blades may be arranged to pass tangentially of the periphery of the work. In other instances a circular series of blade edges may enter internally or surround externally a circular work piece to accomplish turning of either interior or exterior surfaces. These surfaces may be in a single plane or several planes, or to better illustrate, there may be several diameters including angles or radii, the cutters conforming in design to the requirements. The blade edges are preferably in parallel, and each blade has a decided clearance angle, thereby avoiding undue heating and friction. Also, each blade preferably includes an angular rake surface which may terminate in a well rounded or circular surface so as to properly discharge chips without undue strain or distortion.

THE BULLARD COMPANY
Bridgeport, Connecticut

Simple Application of the Principle



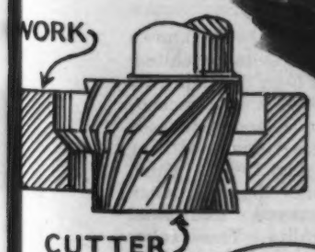
For Pistons and Crankshafts

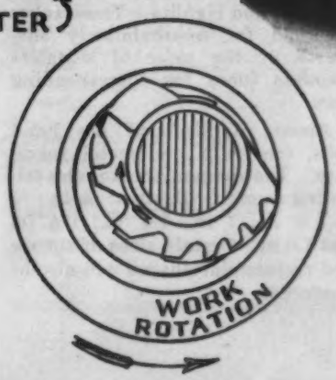


The ROTO-BROACH can be applied to manufacturing units of the multiple or single spindle types as long as the machines provide for properly rotating the work and for relative movement of the tool.

Illustration shows a Bullard 12-Spindle Contin-U-Matic equipped with both internal and external Roto-Broach.

Six spindles continuously rough and finish internally, while the other six rough and finish externally.

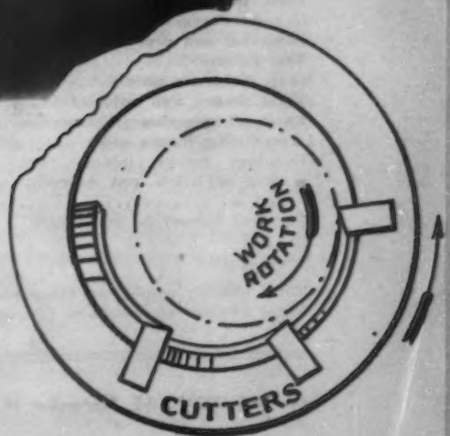




The Internal Tool

The External Tool

Roughing and Finishing the O. D.



NEWS OF THE WEEK

Steel Industry's Net Income in First Half Was 22% Above 1934

NET income of 158 companies in the iron and steel industry aggregated $30,923,927 after all charges in the first half of 1935, an increase of 22 per cent over the $25,305,232 net income of the same companies in the first six months of 1934, according to an anouncement by the American Iron & Steel Institute.

The 158 companies comprise about 96 per cent of the total ingot and finished steel capacity of the industry, and more than 93 per cent of the pig iron producing capacity.

The net income in the first half of this year represents a net of approximately $2.20 per ton on the 14,000,000 gross tons of all iron and steel products produced for sale by the companies during the half. In the corresponding period of 1934 the net income of the companies represented approximately $1.70 for each of the 15,060,000 gross tons of products produced for sale.

Earnings before interest charges but after depletion and depreciation in the first half of 1935 represented a return of 1.04 per cent on the aggregate of $4,676,993,912 invested in the 158 companies. This compares with earnings in the first half of 1934 of 0.91 per cent on an investment of $4,742,712,664. Over the whole of last year 0.48 per cent was earned on the investment.

Although the rate of operations of these companies in the first half of 1935 was slightly below the rate in the first six months of 1934—46.7 per cent of capacity this year as against 47.1 per cent in 1934—total payrolls of the companies went up more than 8 per cent.

Payrolls Up Sharply

During the first six months of 1935 payrolls of the 158 companies aggregated $346,151,525, which compares with payrolls of $319,989,331 in the first half of last year. Largely responsible for the greater payrolls in the first half of this year is a 10 per cent increase in wage rates which went into effect in April, 1934, and is still in effect. For the whole of 1934 the companies' payrolls aggregated $585,765,032.

Stockholders in the 158 companies outnumber the employees. On December 31, 1934, outstanding stock in the companies was held by 491,000 men and women, while in that month the companies had 369,000 employees. In June, 1935, the number of employees was 399,359.

Dividend payments of $13,376,001 in the first six months of this year, however, represented approximately 4c. for each dollar in payrolls.

In the first half of last year dividend payments of $9,807,023 represented only 3c. for each dollar of payrolls. Over the entire 12 months of 1934 for every dollar going into payrolls, less than 4c. was paid out in the form of dividends.

The following table summarizes data on income, dividends, payrolls and rate of operations for the 158 companies by six-month periods since January, 1934.

	Jan. to June, 1935	Jan. to June, 1934	July to Dec., 1934
Total income	$110,646,066	$105,307,390	$38,186,380
Interest charges	17,615,232	17,773,622	17,403,436
Depletion and depreciation	62,106,907	62,228,536	58,829,667
Net income	30,923,927	25,305,232	38,046,723*
Cash dividends paid	13,367,001	9,807,023	12,994,012
Total wages and salaries	346,151,525	319,989,331	265,775,701
Rate of operations (companies producing ingots only)	46.7%	47.1%	26.6%
Earnings before interest but after depletion and depreciation	48,539,159	43,078,854	20,643,287*
Per cent earned on investment	1.04%	0.91%	0.44%*

*Deficit.

Total number employees (December, 1934)	369,364
Total number stockholders (December, 1934)	490,351

Develops Stainless Structural Tubing

A STAINLESS steel tube, known as Allegheny metal architectural tubing, has been developed by the Allegheny Steel Co., Brackenridge, Pa. The new product is thin-wall stainless tubing, with or without carbon steel inserts which are fabricated into the tube when applications demand additional strength and rigidity. These tubes are sold for approximately one-fourth of the price of seamless stainless tubes for corresponding sizes.

Among applications are hand rails, foot rails and metal furniture. The company makes the following round O. D. sizes: ⅝ in., ¾ in., ⅞ in., 1 in., 1¼ in., 1½ in. and 1.9 in. Certain sizes of square and rectangular shapes will also be produced.

Steel Fabricators Make Brooks Executive Vice-President

THE board of directors of the American Institute of Steel Construction has voted to create a new office to be designated as executive vice-president and has elected Robert T. Brooks of New York to fill it. This action will be confirmed at the thirteenth annual convention of the institute to be held at White Sulphur Springs, W. Va., Oct. 16, 17 and 18 next.

Mr. Brooks has been identified with the structural steel industry in New York for the past 30 years. For a number of years he was vice-president of John J. Radley & Co., Inc. In 1914, he joined the firm of George A Just Co. as vice-president and in 1919 became its president. He has been treasurer of the American Institute of Steel Construction for the past four years.

R. T. BROOKS

During the time he was managing his own business, Mr. Brooks served the building industry in New York in many important capacities. He was a charter member of the Structural Steel Board of Trade of New York, vice-president of the Iron League of New York, and chairman of the American Institute of Steel Construction Committee on Trade Practices, Cost Accounting, etc.

Autumn Expansion Beginning in British Iron and Steel Markets

LONDON, Sept. 16.—(*By Cable*)—The iron and steel market is active and signs of autumn expansion are beginning. Yet the European political situation is holding up many overseas orders. Bookings of pig iron up to December are heavy and makers are refusing contracts for delivery early in 1936. Activity in home industries suggests further expansion in pig iron, but exports are quiet.

Intensified pressure for supplies of British semi-finished steel is reported and makers are refusing forward contracts. Finishing mills are busy owing to the large requirements of the building industry and constructional engineering. Shipbuilders' specifications are better. Sheet makers are benefitting from motor trade activity.

The tinplate market is active with forward buying heavy. Output is at about 56 per cent of capacity and unfilled orders stand at about 2,500,000 boxes.

British Prices, f.o.b. United Kingdom Ports

Per Gross Ton

Ferromanganese, export	£9
Billets, open-hearth	£5 10s. to £5 15s.
Tin plate, per base box	*18s. 2d. to 18s. 7½d.*
Steel bars, open-hearth	£7 17½s.
Beams, open-hearth	£7 7½s.
Channels, open-hearth	£7 12½s.
Angles, open-hearth	£7 7½s.
Black sheets, No. 24 gage	£9 5s.
Galvanized sheets, No. 24 gage	£11 5s.

*To Nov. 1; 18s. 5d. to 18s. 10½d. thereafter.

Official Continental Prices, f.o.b. Continental Ports

Per Metric Ton, Gold £

Current dollar equivalent is ascertained by multiplying gold pound price by 124.14 to obtain franc equivalent and then converting at present rate of dollar-franc exchange.

Billets, Thomas.	£2 7s.
Wire rods, No. 5 B.W.G.	£4 10s.
Steel Bars, merchant	£3 5s.
Sheet bars	£2 8s.
Plate, ¼ in. and up	£4 2s. 6d.
Plate, 3/16 in. and 5 mm.	£4 4s. 8d.
Sheets, ⅛ in.	£4 9s. 8d.
Beams, Thomas.	£3 2s. 6d.
Angles (Basic)	£3 2s. 6d.
Hoops and strip base	£4 2s. 6d.
Wire, plain, No. 8	£5 7s. 6d.
Wire nails	£5 15s.
Wire, barbed, 4 pt. No. 10 B.W.G.	£8 15s.

Alloy Casting Group To Meet in Chicago

THE first national convention of the Alloy Casting Association will be held at the Edgewater Beach Hotel, Chicago, on Oct. 5 and 6. These dates were selected because of the interest of the members of the association in the National Metal Exposition, to be held in Chicago, from Sept. 30 to Oct. 4.

While the Alloy Association is only a little over two years old, it is significant of its development that it was one of the first associations to meet after the Supreme Court had adjudged the NRA unconstitutional at which meeting the members of the association by unanimous approval voted to adhere to all provisions which were embodied in the code.

The members of this industry do a nation-wide business and it is a recognized fact that this industry, while comparatively young, has materially contributed through its development of the heat and corrosion resisting field to the present day efficiency of the equipment wherein alloy castings are used.

Membership in the association is restricted to those companies who manufacture castings containing 16 per cent chromium and/or nickel, or more. Plants of its members are located in 18 states.

Fairless Honored At Luncheons

A LUNCHEON in honor of Benjamin F. Fairless, president-elect of the Carnegie-Illinois Steel Corpn., was held at the William Penn Hotel, Pittsburgh, Sept. 18. Invitations were sent out to nearly 300 people, including executives of other subsidiaries, leading customers and friends of the United States Steel Corpn. Guests of honor besides Mr. Fairless included Myron C. Taylor, chairman of the board, William J. Filbert, chairman of the finance committee, and William A. Irvin, president of the Steel Corporation. A similar

luncheon will be held in Chicago, probably on Thursday, Sept. 19.

The unification of the Carnegie Steel Co. and the Illinois Steel Co. becomes effective Oct. 1. No further information regarding the implications of the merger has been given out.

Strips to Be Spot-Welded Together in Ford Mill

IN the new continuous sheet and strip mill nearing completion at the Rouge plant of the Ford Motor Co. the ends of pieces of strip steel will be spot-welded together. This method of joining will be used in place of stitching. The stitcher is a large, complicated and costly machine and involves heavy loss of material because the strips must be lapped 2 to 3 ft. in stitching.

All of the finishing strip mills in the new continuous plant are being equipped with automatic spot welders which fasten the strips together with 12 spot welds on a ½-in. lap as the strip goes into the finishing rolls. The spot welder is small and comparatively inexpensive, and operates while the strip steel is moving through.

Requires Registration Of All Engineers

The legislature of Wisconsin has just passed a law requiring the registration of all persons offering to practice professional engineering. This applies to all branches of engineering. Architects and civil engineers have been registered in the past under a law passed in 1931.

Bulletins of information and application blanks may be obtained by writing to Arthur Peabody, secretary, Wisconsin Board of Examiners of Architects and Engineers, Capitol Building, Madison, Wis.

Brooke Furnace to Resume Productiion

The E. & G. Brooke Iron Co., Birdsboro, Pa., is rushing repairs and improvements at its No. 3 blast furnace so that operations may be resumed Oct. 1. The Brooke plant discontinued operations two years ago, with a large amount of iron stocked. Sales have materially reduced this stock.

OBITUARY

DAVID J. CHAMPION, president, Champion Rivet Co., Cleveland, and for 40 years an outstanding leader in the rivet manufacturing industry, died Sept. 10 a few hours after he had suffered a stroke. He was 74 years of age. A native of Cleveland, Mr. Champion when a young man became affiliated with the steel industry in 1882 as a stenographer for the Cleveland Rolling Mill Co., now a part of the American Steel & Wire Co. Becoming convinced that steel rivets would prove superior to iron rivets, then exclusively used, Mr. Champion in 1895 founded the Champion Rivet Co., of which he became vice-president and general manager, the president being Wilson Chisholm, son of Henry Chisholm, founder of the Cleveland Rolling Mill Co.

D. J. CHAMPION

W. H. HUNTER

Starting in a small way the company under Mr. Champion's guidance grew from a plant with one rivet machine to a large industry with plants in both Cleveland and East Chicago, Ind. Distinguished for his affable manner, colorful personality and for his deeply religious character, Mr. Champion contributed generously to church and philanthropic activities. He was a firm believer in the Golden Rule and the rendering of service to others always was uppermost in his mind. A devout Catholic and a leading layman in that denomination in Cleveland, he was honored in 1932 by being made a Knight Commander of the Order of St. Gregory the Great by Pope Pius. Mr. Champion was a member of the American Iron and Steel Institute, American Society of Mechanical Engineers, Cleveland Engineering Society and various other organizations. Mr. Champion leaves one son, T. Pierre Champion, who is vice-president of the Champion Rivet Co.

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WILLIAM H. HUNTER, since 1930 manager of the Chicago office of the Pratt & Whitney Co., Hartford, Conn., died on Sept. 1 in Cleveland, where he was attending the National Machine Tool Show. He was born 48 years ago in Philadelphia and joined the Pratt & Whitney Co. Philadelphia office as a clerk at the age of 16 years. He served at that office continuously and became its manager in 1928. Two years later he was transferred to the Chicago office.

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NICHOLAS A. DOYLE, vice-president of the American Car & Foundry Co., died in Chicago on Sept. 9 while enroute to his home in St. Louis from a vacation in Wisconsin. He was born in Pittsburgh 68 years ago. He started in business as a clerk in the office of the Michigan Car Co., Detroit, in 1886, and continued with that company and its successor, the Michigan Peninsular Car Co., until the formation of the American Car & Foundry Co. in 1899. He was elected auditor of that company in 1906 and vice-president resident in St. Louis in 1917.

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JOHN W. MARSH, president of the Marsh Stencil Machine Co., Belleville, Ill., for the last 25 years, died recently at the age of 65. Previously he had been a stove manufacturer.

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CHARLES FELL, for 20 years general manager of the Lorain, Ohio, plant of the National Tube Co., died on Aug. 28, aged 70 years. His first employment with the com-

pany was as a blacksmith's helper at the McKeesport, Pa., works. From this minor position he worked up through various departments to the position he held at the time of his retirement five years ago.

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EDWARD REYNOLDS BLAGDEN, retired executive of the United States Steel Corpn., died at Hyannis, Mass., after a long illness. Mr. Blagden was born in Boston 67 years ago. After his graduation from Massachusetts Institute of Technology he served as secretary to his uncle, the late E. C. Converse, then president of the United States Steel Corpn. For some time he was in charge of the St. Louis office of the National Steel & Tube Co., in charge of its Mid-Western division.

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EARL P. SEDGWICK, president, Chicago Hardware Foundry, North Chicago, Ill., died Sept. 13, after a four weeks' illness at the Victory Memorial Hospital, Waukegan, Ill. Mr. Sedgwick was born at Wheaton, Ill., 68 years ago. He helped to organize the Chicago Hardware Foundry Co. as a subsidiary of the Chicago Hardware Mfg. Co., with which he had been employed since 1885. He was made secretary and treasurer of the new firm and in 1921 he was elected president.

Machine Tool Index Advances Again

MACHINE tool orders continue to climb, having increased 5 per cent in August over July, according to the monthly report of the National Machine Tool Builders' Association. The August index is 125.8 as compared with 119.8 for July.

Foreign orders increased in August, accounting for 37 per cent of the total business, and domestic business fell only slightly below July. Business reported for eight months is 18 per cent above the full year's business last year.

Railroad Equipment

Detroit, Toledo & Ironton has placed four 2-8-4 type freight locomotives with Lima Locomotive Works.

Cerro de Pasco Copper Co., Peru, is in the market for 20 ore hopper cars.

Coos Bay Lumber Co., Marshfield, Ore., has ordered a 2-8-2 type locomotive from American Locomotive Co.

South African Railway and Harbors Administration, Johannesburg, South Africa, is inquiring for 500 four-wheel 20-ton gondola cars and 450 eight-wheel 42-ton gondola cars.

PERSONALS

WALTER H. GARDNER, heretofore manager of special sales of the Caterpillar Tractor Co., has been made general sales manager of the Keystone Steel & Wire Co., Peoria, Ill. He was formerly sales manager of the Yuba Mfg. Co., maker of mining and farming machinery. Later he served in an advisory capacity with the Ventura Refining Co. and with the western division of the Taylor Wharton Iron & Steel Co.

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GEORGE C. LLOYD, the accomplished secretary of the (British) Iron and Steel Institute who retired two years ago after 25 years in the office, has been honored this month by the presentation of a gift widely subscribed to throughout the membership of the institute. Mr. Lloyd gave the institute exceptional service. He has warm friends among American members, many of whom will recall his participation in the visit of British metallurgists to the United States in 1912 to attend the Sixth Congress of the International Association for Testing Materials.

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A. W. BURKET has been appointed Chicago district manager of the Griscom-Russell Co., maker of heat exchange equipment. He will make his headquarters at 20 North Wacker Drive, Chicago, and will supervise direct sales and agency activities in the Chicago, St. Louis, Detroit, Milwaukee and adjacent territories.

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R. L. WAHL, who has been identified with the Inland Steel Co., since 1913, has been appointed general superintendent of iron ore mines, succeeding WILLIAM WEARNE, who has retired. R. D. SATTERLEY has been made superintendent of Morris Mine and F. A. OLSON, superintendent of Greenwood Mine. They will be located at Ishpeming, Mich.

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R. L. COREY, formerly vice-president of Allied Motor Industries, has been made district sales representative in Indiana, Illinois, Wisconsin, Iowa, Missouri and Minnesota for Aluminum Industries, Inc., Cincinnati. He will make his headquarters at the newly opened office of the company at 616 South Michigan Avenue, Chicago. N. R. PATTERSON, for the past year sales engineer for the company, has been transferred to the Chicago office.

W. H. GARDNER

JAMES D. CUNNINGHAM, president, Republic Flow Meters Co., Chicago, has accepted chairmanship of the Individual Gifts Division of the 1935 campaign for the Community Fund of Chicago.

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GEORGE S. WHYTE, president of the MacWhyte Co., Kenosha, Wis., manufacturer of wire rope, cable, and aircraft specialties, has returned from Europe, where he visited Olso, Stockholm, Copenhagen, London and Edinburgh.

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WILLIAM F. GRAVER, formerly president of the Graver Corpn., Chicago, has taken charge of the storage tanks division of Erman, Howell & Co., who operate a railroad tank car dismantling plant at 300 West Eighty-seventh Street, Chicago.

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J. P. DISTLER has been appointed manager of sales, wire division, Republic Steel Corpn., with headquarters at the Grand Crossing plant in Chicago. Mr. Distler succeeds R. W. HULL, whose duties as assistant manager of sales for all Republic products in the Chicago district will now receive his entire time. Prior to his present appointment Mr. Distler had been connected with Keystone Steel & Wire Co. continuously since 1918. For the past five years he has been general manager of sales for Keystone, following 10 years of experience as assistant sales manager. For the past two years he has served on the commercial committee of the American Iron and Steel Institute.

THIS WEEK IN WASHINGTON

Doom of reciprocal trade agreements seen in abolition of tariff concessions to Germany.

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Treaty with Canada held up by objections of agricultural interests.

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Plans underway for extensive potato "bootlegging."

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Hopkins declared winner in row with Ickes over work relief allotments.

o o o

Plans announced for exhaustive studies looking to a new NRA.

o o o

Court test of Guffey-Snyder act is postponed as bituminous coal strike is put off for sixth time.

o o o

BY L. W. MOFFETT

Resident Washington Editor, The Iron Age

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WASHINGTON, Sept. 17.—President Roosevelt yesterday formally ordered withdrawal of all reciprocal duties from Germany. Effective Oct. 15, the order was issued after the State Department informed the President that the most-favored-nation clause of the German-American commercial treaty will expire on that date. Germany one year ago served notice it would abrogate the treaty next month.

This is interpreted as a forerunner to a collapse of the reciprocal tariff policy. . . . While possibly a far-fetched view, it does not give definite proof that Mr. Hull is firm in his oft-stated purpose of withdrawing concessions in duties growing out of reciprocal tariff agreements from countries which continue to deny the United States equality in exports treatment.

It is because of differing views between the two countries that the long-pending tariff agreement between the United States and Canada has not been concluded. . . . And while the rift with Germany and the difference with Canada may reflect far greater limitations of the reciprocal tariff policy than was hoped for by the State Department, these developments certainly are not being accepted by the Administration as meaning a breakdown of the policy as a whole. . . .

There is a common point involved in both the German and Canadian situations. . . . It relates to the idea of "balance of trade." . . . The German plan is to buy from any given country only as much as it can sell to such a country. . . . Berlin dispatches say that Germany proposes to continue that policy and therefore will not alter the German-American trade treaty, effective Oct. 15, which omits the most-favored-nation clause heretofore carried in treaties made with Germany. . . .

Exports from the United States to Germany at present exceed exports from Germany into the United States. . . . Germany now makes "balanced trade" and barter agreements by which that country grants lower import duties to some countries than it grants to the United States. . . . Germany's contention is that this is necessary in order to obtain raw materials for German industries. . . . Canada has suggested that if Canada is to continue prompt payment of its obligations to the United States, "the exports of Canadian goods to the United States must be increased or the imports of goods from the United States into Canada decreased."

Secretary Hull, in a note to Canada, stated that "International balances are settled on many fronts, and it would be a serious setback to world trade if countries undertook to achieve balances with individual countries." . . . Nor would Mr. Hull make a commitment in advance as to reductions in duties on specific products. . . . Canada had suggested as a "suitable basis" for negotiations that the United States reduce by 50 per cent its tariffs on lumber, fish, potatoes, milk and cream, and live cattle. . . . Agricultural interests have been vehement in their attacks on Mr. Hull when reductions in duties on agricultural products were suggested. . . . And it will be observed that, as usual, the agricultural interests have won the day, contrasting strikingly to failure of manufacturing interests in their protest against reduced duties. . . .

Mr. Hull skirted the Canadian suggestion for reduced duties on lumber and agricultural products. . . . He said that the United States could not make advance commitments but that "each product must

be carefully studied in the light of existing economic conditions before any decision can be reached." . . . Mr. Hull's position certainly is sound, yet manufacturers who have seen protection reduced and their products subjected to increased competition from cheaply produced foreign goods are of the opinion that the State Department has not always given the careful study it should to their lines. . . .

It may be seriously doubted that Canada will be interested in negotiating a tariff agreement if that country can't get reduced duties on the products it listed, inasmuch as they are primary products of Canada. . . . They are, however, highly competitive with similar American products and undoubtedly Mr. Hull would face sharp attack if he agreed to the proposed tariff reductions. . . . It reflects one of the important factors which will limit tariff agreements. . . .

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German Import of Steel Small

The effect on the American iron and steel market in withdrawing reduced duties from Germany and assessing maximum duties instead will be nil when based on present conditions. . . . German imports of iron and steel products into the United States are small and the reduced duties which grew out of the tariff agreement with Belgium, applied to only one commodity which is imported from Germany in anything like sizeable quantities —namely, hoops and bands. This is not to say that reduced duties were not also granted on other steel products and that potentially the reductions were a threat of invasion of the American market from Germany and are a threat of such an invasion from Belgium and other countries which will continue to receive concessions. . . .

Imports of hoops and bands from Germany in the first seven months of 1935 totaled 2059 tons, compared with 1772 tons in the corresponding period of last year. . . . The duty on hoops and bands was reduced from ¼c. to 1/5c. a lb., effective May 1, 1935. . . . In May, however, imports dropped to 166 tons from 500 in April, but they rose to 332 and 451 tons, respectively, in June and July. . . . Yet the imports in June and July of this year were less than those in the corresponding months of last year, 450 and 455 tons, respectively. . . . The only other steel imports of any consequence coming from Germany are "other pipe," chiefly seamless tubes; barbed wire, and nails and tacks and staples. . . . Barbed wire is free of duty and therefore cannot figure in reciprocal tariff agreements. . . . No reductions have been made in duties on "other" pipe, and nails, tacks and staples. . . . Imports of all four classifications from Germany in the first seven months of the current year aggregated 29,817 tons, of which 12,486 tons or approximately 42 per cent, consisted of barbed wire, free of duty. . . .

Imports of this group of products in the first seven months of last year totaled 11,777 tons, of which 5051 tons, also approximately 42 per cent, consisted of barbed wire. . . . Total imports of all iron and steel products from Germany in the first seven months of 1935 were 43,336 tons, compared with 18,769 tons in the corresponding period of 1934. . . .

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Potato Bootlegging—The Next Great Industry

It would be excrutiatingly ironic if Secretary Hull should agree to a reduction in the duty on spuds. . . . Not that there is the remotest chance that he will. . . . For on Dec. 1 the potato is to be regimented, and woe to the citizen who dares to grow and market over five bushels, unless duly tagged and stamped, all under the sharp eye of governmental espionage. . . . This uncontrollable potato control legislation, the supreme asininity of the recent session of an unusually asinine Congress, is the freakiest part of the freak Agricultural Adjustment Act. . . .

Oncoming potato bootleggers are already reported to have devised a method of beating this cap-and-bells law. . . . Sleuths are hereby tipped off that the bootlegging fraternity has worked out the ingenious plan of planting the potatoes with eyes downward, forcing the vines into the earth. . . . Obviously this will conceal the potato vines from both the sleuths and potato bugs. . . . The potatoes will be excavated and marketed during dark, stormy nights. . . . The idea is an offshoot of the plow-under program. . . . It will be known as the grow-under plan. . . .

And while dealing with the spud control legislation, let it be said with loud and deserved praise for the New Deal that it was not hatched by the New Deal. . . . Strange as it may seem, it was inspired by Republicans from potato-growing sections, some of them of the so-called conservative type. . . . They swapped Guffey-Snyder coal control votes for potato control votes, the only way either piece of legislation could have been log-rolled onto the statute books. . . . And both likely will be rolled off again. . . . The AAA was strongly opposed to the potato control act and naturally does not enjoy the job of its impossible enforcement. . . .

The Republican-inspired potato control act emphasizes the fact that party lines disappear completely when it comes to voting pap to the agricultural interests. . . . Intelligent legislative aid for the farmer unquestionably has the approval of the country as a whole, but farmers themselves must be both amused at and contemptuous of the many quack legislative doses given them in an effort to seek political support and setting them apart as a favored group from the urbanite who gets soaked. . . .

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Work Progress Settled

There were strong odds that Works Progress Administrator Harry L. Hopkins would win with his boondoggling program against Public Works Administrator Harold L. Ickes with his heavy industry program. . . . The Presidential "conciliation" of the differences between Mr. Hopkins and Mr. Ickes at Hyde Park simply confirmed the expected. . . The harassing and often-changed $4,000,000,000 works relief program as finally worked out —at least for the present—gives Mr. Hopkins the toehold, with Mr. Ickes hanging on the edges. . . . Most of the unallocated fund of $1,250,000,000 goes to the former to be used immediately to cut down the relief roll regardless of the value, if any, of the "work" to be done. . . . Coincidently, Mr. Ickes is denied his wish for a large part of the fund to be used in financing grade crossing elimination, low-cost housing and other permanent undertaking that would have thrown business to heavy industries for steel, machinery and other requirements that would have meant both direct and indirect employment on work of a constructive character. . . .

Under the cost limitation of $850 per man year it is clear that Mr. Ickes and the essential industries that would have profited considerably from his program will not get far. . . . With the deadline for allotments set for today, it is proposed, in the mad rush to get 3,500,000 off the relief rolls by Nov. 1, to use most of the money for thinly disguised doles, a mere temporary expedient that actually does not relieve unemployment conditions, but, on the contrary, means their continuance. . . .

PWA allotments, it is reported, will aggregate $427,000,000, which compares with $900,000,000 carried in the works relief act. . . . Even with the curtailed allotment, restrictions on PWA projects are so strin-

gent that even the smaller amount of money may not be expended. . . . Of the latter also $127,000,000 has been allotted, leaving a supplemental allotment of $200,000,000 to be made, together with $100,000,000 to be transferred from the housing division. . . . The transfer of the funds from the housing division is in line with the reported policy for PWA to complete only projects begun and those already under way. . . . It is expected that Mr. Hopkins or someone else will get $100,000,000 through a transfer from the Rural Electrification Administration for which this sum had been earmarked, and REA financed through self-liquidating loans by the Reconstruction Finance Corporation. . . . Mr. Hopkins also was given an additional $85,000,000 for direct relief over and above the $715,000,000 previously turned over to him. . . . Rexford G. Tugwell, Rural Resettlement Administrator, finds his plan to care for 330,000 rural families sharply curtailed, the total to be cut down to 160,000 with probable like curtailment of the $525,000,000 requested by Dr. Tugwell. . . . The President insists on housing paying for itself. . . .

The Civilian Conservation Corps will be brought up to its allotted strength of 600,000 by means of an additional $75,000,000. . . . Under restrictions placed on PWA it will have to move quickly, for all contracts must be let for projects by Dec. 15 and they must be completed within one year from that date. . . . The projects must be located in areas where the necessary labor is available and the Government cost must not exceed $850 annually per man. . . . PWA is to expend only 45 per cent of the cost of projects, the remaining 55 per cent to be paid by local communities. . . . Assuming they can be begun in time, the total value of PWA projects will be about $1,000,000,000. . . .

Inasmuch as applications have been received for projects aggregating a cost of some $2,600,000,000, it is clear that even a minimum rejection of 50 per cent will have to be made. . . . About 5000 applications for PWA projects are still before Mr. Hopkins, who already has turned down 2000 projects. . . .

In a nutshell, the huge outpouring of the taxpayers' money will go largely for boondoggling, meaning a revival of CWA to be engaged in turning over the fall leaves, leaning on spade handles, and eurythmic dancing. . . .

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California Project to Take Much Steel

Large quantities of steel, together with generating and other machinery, will be used in the construction of the $170,000,000 Central Valley project in California, for which an initial allotment of $20,000,000 has been approved by the President. The allotment, announced by the WPA Division of Applications and Information, was made to the Bureau of Reclamation, Department of Interior.

Dr. Elwood Mead, reclamation commissioner, said that a dam at Friant, Cal., on the San Joaquin River, probably would be the principal work undertaken through the use of the first allotment. The cost of this dam is estimated at $14,000,000. It will require 170 tons of steel outlet pipe, 850 tons of steel drum gates, and sizeable requirements of structural shapes, piling and reinforcing bars. The dam will require 1,328,000 cu. yd. of concrete. The contemplated power plant at Friant will have two generating units each consisting of 18,000-hp. turbines. Among steel requirements for the power plant will be 290 tons of steel pipe, 400 tons of valves and 65 tons of structural material.

The largest unit in the project is the Kennett dam and reservoir, which will cost $60,601,600, of which $14,251,900 will be for a power plant. The steel requirements of the power plant will include 580 tons of structural material and 11,750 tons of pipe.

The Denver office of the Bureau of Reclamation will take bids for materials and machinery and will also prepare plans and specifications.

Walker R. Young, supervising engineer during the construction of Boulder Dam, has been designated by Secretary of the Interior Harold L. Ickes and Dr. Mead as engineer in charge of the Central Valley project. He will go to California to make plans for getting the construction of the project under way as soon as he can dispose of matters before him and turn his office over to Ralph Lowry, field engineer, who will complete the job at Boulder.

It was announced that the first preliminary work to be undertaken will be the signing of the necessary repayment contract and obtaining rights of way. The features to be constructed will be decided after inspection on the field by the Bureau of Reclamation.

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Bids Opened On Generating Contracts

Submitting a figure of $1,342,000, the General Electric Co. was low bidder for furnishing and installing two 82,500-kva. generators for the Boulder Dam power plant. The bids were opened in the Denver office of the Bureau of Reclamation, Department of the Interior. Each generator will weigh 4,300,000 lb.

The Pelton Water Wheel Co., San Francisco, was low bidder on the two 115,000-hp. turbines at $551,000 for delivery all-rail and $556,000 for delivery by water. The Pelton proposal called for manufacture of the turbines in Eddystone, Pa.

The Woodward Governor Co., Rockford, Ill., was the only bidder on the two governors. It submitted a bid of $30,800 for rail delivery and $31,840 for water delivery.

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Regulations for Wagner-Connery Act Announced

Setting up three-man regional boards in 21 cities, the National Labor Relations Board on Monday announced regulations for administration of the Wagner-Connery labor act. Adopting a procedure similar to that of the Federal Trade Commission, the board said complaints against employers will be issued in the name of the board rather than in that of parties filing charges of violations.

Each regional board will consist of a director, trial examiner and attorney. When a complaint is filed by a union, investigation will be made by the regional director, who, if he holds the charges are justified, will make a formal complaint. Testimony then will be taken by the trial examiner, the attorney to represent the director. The trial examiner will recommend either that the charges be dismissed or that a "cease and desist" order be issued. Appeal may be made by either the union or the employer to the board in Washington with the right of making argument on testimony. The employer may also appeal from the order of the National Labor Relations Board to a Circuit Court of Appeals. The board likewise will appeal to the court where employers refuse to comply with its orders.

Original hearings are to be held before regional boards as a general policy. However, the board in Washington may on occasion issue a complaint and proceed with a case under the same regulations as those guiding the regional boards. It may also order a hearing transferred from one regional office to another.

Regional boards will operate in Boston, New York, Pittsburgh, Philadelphia, Baltimore, Atlanta, New Orleans, Detroit, Cleveland, Cincinnati, Chicago, Milwaukee, Minneapolis, St. Louis, Kansas

City, Fort Worth, Tex.; Los Angeles, San Francisco, Seattle, Indianapolis and Buffalo.

The board pointed out that its regulations provide for two closely related functions authorized by the act: One to conduct employees elections where there is contention concerning who shall represent the workers; the other, to order employers to end specified unfair labor practices held likely to frustrate collective bargaining.

It stated that the specific practices held unfair and the only ones which can be matters of complaints may be summarized as follows: Interference with the guaranteed rights of self-organization and collective bargaining; employer domination of a company union (although company unions freed from such domination are legal under the act); discharging a worker, or discriminating against him, because of union activity or because he has filed charges or has given testimony under the act; and refusal by the employer to bargain collectively with the proper representatives of the workers.

Hearings on complaints and on petitions for elections will be public unless otherwise ordered. A sworn petition requesting the board to certify the representatives selected for the purpose of collective bargaining may be filed by any person or labor organization. It ordinarily will be filed with the local regional board, except that the National Board at its discretion may receive and act upon petitions. In addition to the names and addresses of the union and the employer, the board said, the petition should contain a description of the bargaining unit, including the number and classification of the employees in it, and the names of other labor organizations which claim to represent any of the employees in it. There should also be set forth the nature of the controversy affecting commerce that has arisen concerning representation.

The National Board has moved its offices from the Department of Labor to the Denrike Building, 1010 Vermont Avenue.

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Guffey Act Court Test Postponed As Coal Strike Again Is Put Off

While it did not constitute a test as to its constitutionality, the first attack on the Guffey-Snyder coal act failed in the Supreme Court of the District of Columbia, Monday. Judge Daniel O'Donoghue upheld the contention of Assistant Attorney General John Dickinson that the application for a temporary injunction against the act made by Attorney F. H. Wood of New York on behalf of President James Walter Carter of the Carter Coal Co. was premature.

The act does not become effective until Nov. 1 and Judge O'Donoghue declared that there was no showing that it would effect immediate danger to the coal company. He pointed out that the Bituminous Coal Commission provided in the law has not been appointed, that no codes can be promulgated until it is selected and that under any circumstances taxes cannot be assessed under the law until after it becomes effective.

The hearing, however, provided no actual test as to the constitutionality of the act and it has been accepted as a foregone conclusion that the case will be taken to the Supreme Court of the United States for final decision.

Meanwhile Appalachian coal operators and the United Mine Workers continued wage and hour negotiations looking to renewal of contracts after a breakdown of the negotiations last Saturday, the deadline set by the union which threatened a nation-wide coal strike unless its terms were accepted by that time. For the sixth time, however, another truce was declared through indirect intervention by President Roosevelt.

Under the truce, agreed upon at the request of Edward F. McGrady, Department of Labor negotiator, acting for the President, the prevailing wage and hour contract was continued until Sunday of the present week. The truce was arranged by the miners abandoning their demand for a retroactive clause in any extension of the agreement and by the operators foregoing their proposal for a two-week extension of the present contract. The miners are demanding a 30-hr. week, a daily wage increase of 50c., a 15c. increase in tonnage rates and a 25c. increase for yardage and bedwork. The operators are holding out for continuance of the present scale of wages and hours until April 1 of next year.

Widely Diversified NRA Studies May Be Basis for New Legislation

WASHINGTON, Sept. 17.—Divided into "major," "medium," "limited" and "minor" groups, studies instituted by the National Recovery Administration cover a wide range of activities bearing on the industrial life of the nation. The studies encompass practices prevailing before, during and since codification and will develop a vast array of factual matter gathered from records of NRA and additional information which is being asked direct from industries of the country.

While it has been represented that the material is being prepared to serve industry, it is also considered to have in mind prospective legislation asked for by the President in connection with his suggestion for reestablishing a powerful NRA at the next session of Congress. The studies include broad legal questions which appear to look to means of again setting up NRA as an industrial regulatory body within the limitations of the Supreme Court decision in the Schechter poultry case. As it exists today NRA, with a personnel still at a level of some 3000, is simply a fact-finding organization with no regulatory power whatsoever.

Whether or not the studies are actually to be used as a basis for new legislation remains to be seen. The general feeling of industry is said to be that it desires no further NRA regulation. There are units of business and industry which apparently would welcome a return to the former days of regimentation, particularly some of the smaller units, but in the larger industries it is doubted that much support will be found for resurrecting NRA as a control organization. And without such support it is believed that such legislation will not meet with favor. It is also pointed out that the public reaction toward NRA during the latter half of its existence had grown unfavorable because it had failed in its objectives and at the same time was responsible for increasing the cost of living.

It is certain that public hostility would find ready reflection in Congress, which, even prior to the Supreme Court decision, had become increasingly critical of NRA. This was made clear in the legislation it enacted after the decision limiting NRA to its present lowly status, though the decision plainly would have permitted Congress to give it much wider powers

The studies under way apparently seek to determine just what these powers may be.

In the "major" studies are included the iron and steel, bi-

tuminous coal, lumber, paper and tobacco industries. Among the "limited" studies is one covering the automotive industry, including its manufacturing, equipment and accessories divisions. Included in the minor studies is one relating to machinery and allied products. There are 23 industries in the entire series of studies. The studies are being made by a so-called Industries Studies Section of which M. D. Vincent is coordinator. In charge of the iron and steel study is R. W. Shannon, deputy administrator, formerly associated with and well versed in the problems of the industry. In charge of the automotive study is George Myrick while George Barber is acting chief of the machinery and allied products unit.

In explaining the studies, an NRA bulletin pointed out that the terms "major" and "minor" speak for themselves. They are to be broad, comprehensive and detailed studies. "Medium" studies will be somewhat less comprehensive. It is proposed they will embrace "high lights." "Limited" studies are to cover only limited phases of the affected industries, "exploring certain aspects more in detail at the expense of coverage of other sections." The designations in short are indicative of the comparative coverage of the industries involved and "have little or no significance with respect to the relative size of the reports or the bulk of material included."

The exhaustive character of the studies, however, was made evident by the bulletin which broke the studies into 10 sections: Industry; trade practices; labor; code administration; NRA organization; legal; special; foreign trade; statistical, and administrative. In turn each studies section is broken into units covering a varied list of topics bearing on the subjects concerned.

Trade Practices to Be Reviewed

The trade practice section, of which Corwin D. Edwards is coordinator, will survey developments of the outstanding trade practice provisions in a wide range of NRA codes for the purpose, the bulletin said, of describing the problems to which these provisions were addressed. Effort will be made to compare NRA experience with related experience before the codes. The intent, according to the bulletin, is to formulate the issues involved in the regulation of trade practices to indicate the degree to which there is sufficient information for conclusions concerning these issues. Thus far, work outlined in this field includes, among other things, data on production and capacity; control which should be sought for industry studies; preliminary outline for open price investigation and a preliminary outline for an investigation of the basing point system. The basing point system, it was stated, is to be studied as to all industries which employ it.

The price filing section is in charge of Enid Baird. The study will include, among other things, customer classification; limits of trade or quantity discounts; resale price maintenance and controlled sales representatives. Included in units under this section are those on destructive relations, I. S. Moise, chief; minimum price, Max Kossoris, chief; production control, H. B. Drury, chief. In connection with production control, study will be made as to devices for limiting of plant capacity, machine hour limitations, etc.

A. Howard Myers is chief of the labor studies section which is charged with the task of investigating, studying and reporting on the bearing of NRA on the general questions of labor and its relation to industrial organization, with special reference to the part labor plays in the production of goods. This section is broken into five units. Among them are those in industry studies and collective bargaining.

Will Report on Code Administration

A study and a report on the administration of NRA codes by code authorities will be made by the code administration studies section of which Robert Gates is coordinator. The study also will cover information bearing on general code authority administration; relations of trade association to code authorities; methods of selection of members of each; the functioning of the trade association in the capacity of the code authority; compliance activities and the functions of code authorities as agents, confidential or otherwise, with respect to price filing, statistical reporting and similar provisions. There are three units under this section.

William Bardsley is coordinator of NRA organization studies. This section will prepare a comprehensive report from an organization standpoint. The study, however, will not only be concerned with organization of NRA itself but also with organization of industry under codes, with special attention to overlapping code definitions, multiple code coverage, classification problems, etc. There will also be included the formulation of policies, development of model codes and code provisions, agreements under Section 4 (a) and 7 (b), exceptions, stays, interpretations, and explanations, amendments, etc.

The legal studies section is in charge of George McNulty, coordinator. The work outlines include among other things: Report on certain legal research under way; outlines applicable to several areas in the legal field, including a tentative plan for industry study; outline for study of interstate commerce; outline for study of standards and labeling practices; outline for investigation of trade practices connected with misrepresentation and deception; Federal control (regulation) through employment of the power of taxation; Federal regulation through employment of treaty powers; due process of law; delegation of power; State recovery legislation in aid of NIRA; problems relative to anti-trust laws; Federal power to regulate commerce among the several States; Federal control (regulation) through employment of so-called spending power; labor research.

Tentative Extension Bill Already Drawn

Heeding the so-called "horse and buggy" decision of the Supreme Court in the Schecter case, a tentative bill for proposed NRA legislation at the next session of Congress has been announced by Chairman Samuel B. Hill of a subcommittee of the House Committee on Ways and Means. The committee will begin hearings about Nov. 15. Mr. Hill pointed out that the skeletonized NRA is engaged in studies on wages and hours existing before, during and since codification and data on these subjects will be laid before the committee.

These studies are part of exhaustive surveys being made by NRA in some 20 industries covering code practices. Material gathered is to be ready in connection with some studies by Dec. 1 but in major studies, such as iron and steel, complete reports will not be available until long after that date, probably not before April 1 of next year when the present NRA act expires. It is evident therefore that whatever use may be made of the studies, a great deal of the data as to major industries will not be prepared in time for new NRA legislation such as has been asked for by the President.

It is also clear that the broad range of the studies include subjects which conceivably seek at some later date still further legislation far beyond the proposals of the tentative NRA bill on which Mr. Hill will call hearings in November. However, it has not been conceded by Administration sources that the studies contemplate legislative action so broad as the studies themselves would imply.

COMPLETE LIQUID PURIFICATION OF GAS

After a thorough investigation the E. I. Du Pont De Nemours Company awarded the Koppers Construction Company a contract for a Two-Stage Soda Thylox Liquid Purification Plant. This plant, designed for 45,000,000 cu. ft. of blue gas per day, has recently been placed in highly successful operation at Belle, W. Va. It is continuously accomplishing 99.8% removal of hydrogen sulphide.

In this process a highly reactive salt solution is used. Ninety-five percent removal is accomplished in the first stage and the secondary stage removes the remainder of the hydrogen sulphide in the gas. The removed hydrogen sulphide takes the final form of Brimstone cake but could also be recovered as agricultural sulphur.

The commercial success of this plant adds another process to those previously developed by Koppers for the Liquid Purification of Gas. A wide variety of equipment is available for removing hydrogen sulphide from all kinds of gas under varying conditions of pressure, concentration and economic circumstances. The user may choose for the best solution of his problem, the Single-Stage Soda Thylox Process, the Two-Stage Soda Thylox Process, the Sodium Phenolate Process, or the Seaboard Process.

We shall be glad to consult with companies having problems involving the removal of hydrogen sulphide from gas.

THE KOPPERS CONSTRUCTION CO.

KOPPERS BUILDING . . . PITTSBURGH, PENNA.

▲▲▲ Capital Goods Index

FOR the period following Labor Day week, THE IRON AGE index of capital goods activity declined by 6.1 points, but this loss was due entirely to the automobile component in which, owing to model changes, the normal seasonal correctives have lately had no compensatory influence on low production figures. The decline in motor car output to 13,470 units, reported for last week,* was especially severe, but should not be taken seriously, as subsequent developments in the industry, it is thought, will be favorable.

The composite index figure for last week of 51.3 is, with one exception, the lowest recorded so far this year. Still it is more than 18 per cent above that for the same period in 1934 and only fractionally beneath the corresponding figure for 1933.

The index number of 57.4 reported for two weeks ago remains unchanged.

*Estimate by Cram's Reports, Inc.

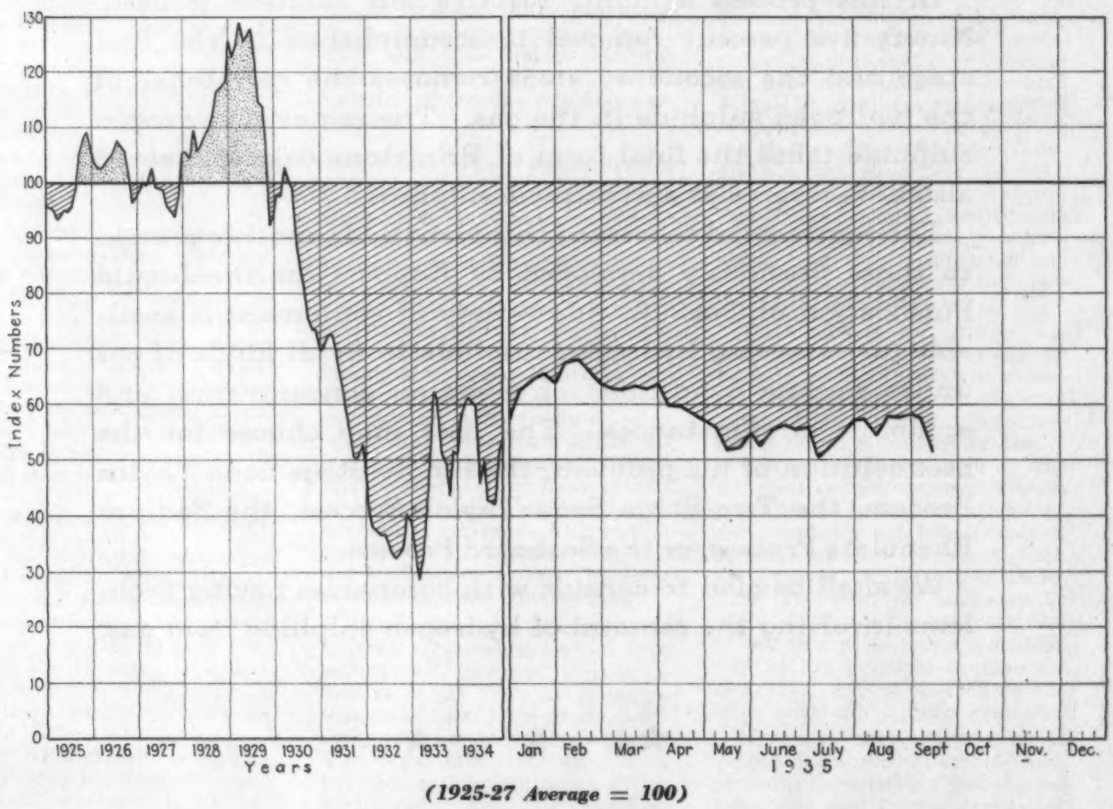
The Iron Age Weekly Index Numbers of Capital Goods Activity

(1925-'27 = 100)

Last week (est.)	51.3
Preceding week	57.4
Same week last month	54.5
Same week 1934	43.4
Same week 1933	51.6
Same week 1932	31.9
Same week 1931	54.0
Same week 1930	80.7
Same week 1929	115.3

Durable Goods Employment Lags

DESPITE the improvement in demand for durable goods which has occurred during the past two years, employment in the industries manufacturing such products is



(1925-27 Average = 100)

The Iron Age Index of Capital Goods Activity. The years 1925 to 1934 are plotted by months, the current year by weeks.

Components of the index: Steel ingot production rate, from THE IRON AGE; revenue freight carloadings of forest products, from Association of American Railroads; automobile production, from Cram's Automotive Reports; heavy construction contract awards, from *Engineering News Record;* index of productive activity in Pittsburgh district, from Bureau of Business Research of University of Pittsburgh.

Deflected Downward ▲▲▲

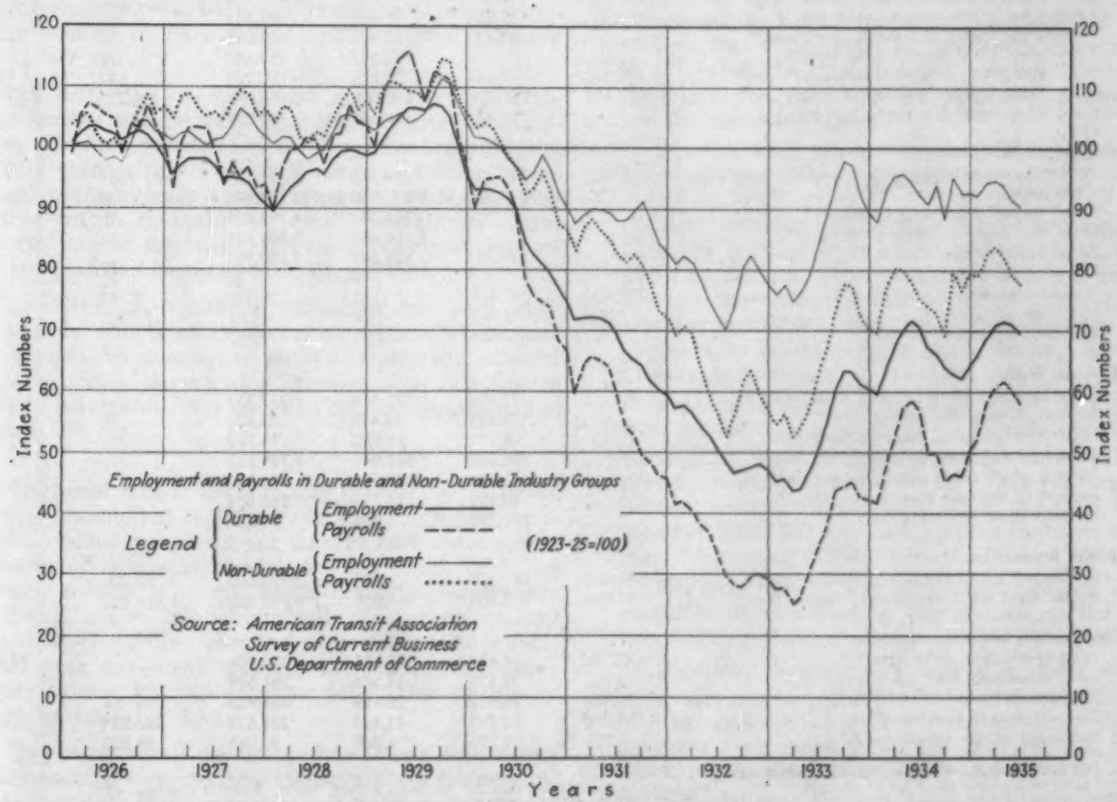
still far below pre-depression levels. The striking contrast between these industries and the manufacture of non-durable goods is shown in the chart at the bottom of the page. Monthly fluctuations in employment and in factory payrolls in both groups of industries are shown on a comparable basis as index numbers based on the monthly average for the three-year period from 1923 to 1925 as 100.

During the period from 1925 to 1929 both groups of industries were relatively stable and on a basis of approximate parity except that the mild business recession in 1927 had an appreciable effect on employment and payrolls in the durable goods industries. It is significant that the effects of the 1928-'29 boom on the durable goods industries were no more pronounced than on the industries manufacturing non-durable products.

The latter industries, however, were much less severely affected by the depression than were the durable goods industries. The maximum decline in employment from the 1929 peak to the low point of the depression was 59.1 per cent in the case of durable goods and only 32.9 per cent in the case of non-durable goods. The declines in factory payrolls, which reflect wage reductions and the prevalence of part-time work, were greater in both groups of industries, being 78.2 per cent and 54.5 per cent respectively.

Employment in the non-durable industries turned upward in the summer of 1932 and for nearly two years has been less than 10 per cent below the pre-depression level, while the recovery in the durable goods industries did not commence until the late spring of 1933, and these industries have not yet recovered as much as half the ground lost during the depression. At recent levels the non-durable industries are back to what may be considered a reasonably normal level of employment; and, in view of the decline in the cost of living, the purchasing power of wages paid in these industries is virtually as great as in 1928.

Until the heavy industries enjoy a similar measure of recovery, however, it is difficult to see how a normal level of prosperity for the nation as a whole can be restored.



Employment and Payrolls in Manufacturing Industries

Source: United States Bureau of Labor Statistics

Current Metal Working Activity Statistically Shown

These Data Are Assembled by The Iron Age from Recognized Sources and Are Changed Regularly as More Recent Figures Are Made Available

	August, 1935	July, 1935	August, 1934	Eight Months, 1934	Eight Months, 1935
Raw Materials:					
Lake ore consumption (gross tons)[a]	.....	2,198,189	1,443,943	16,766,927	.....
Coke production (net tons)[b]	.....	2,612,411	2,323,100	22,344,300	.....
Pig Iron:					
Pig iron output—monthly (gross tons)[c]	1,761,286	1,520,263	1,054,382	12,077,521	13,080,549
Pig iron output—daily (gross tons)[c]	56,816	49,041	34,012	49,702	53,829
Castings:					
Malleable castings—production (net tons)[d]	.....	28,915	23,910	261,339	.....
Malleable castings—orders (net tons)[d]	.....	25,526	21,306	250,815	.....
Steel castings—production (net tons)[d]	.....	.....	43,748	339,401	.....
Steel castings—orders (net tons)[d]	.....	.....	25,538	340,903	.....
Steel Ingots:					
Steel ingot production—monthly (gross tons)[e]	2,919,326	2,270,224	1,381,350	19,273,357	21,214,241
Steel ingot production—daily (gross tons)[e]	108,123	87,316	51,161	92,660	101,992
Steel ingot production—per cent of capacity[e]	48.84	39.44	23.24	42.08	46.07
Employment in Steel Industry:					
Total employees[e]	.....	414,937	404,793	422,615	.....
Total payrolls (thousands of dollars)[e]	.....	$42,725	$34,362	$327,676	.....
Average hours worked per week[e]	.....	31.5	26.5	32.1	.....
Finished Steel:					
Trackwork shipments (net tons)[e]	4,028	4,054	5,364	39,237	20,992
Sheet steel sales (net tons)[f]	.....	206,313	66,064	1,324,225	.....
Sheet steel production (net tons)[f]	.....	145,505	77,197	1,411,714	.....
Fabricated shape orders (net tons)[g]	.....	57,556	95,489	765,934	.....
Fabricated shape shipments (net tons)[g]	.....	94,733	122,482	668,091	.....
Fabricated plate orders (net tons)[d]	.....	.....	16,293	167,649	.....
Reinforcing bar awards (net tons)[e]	101,140	7,645	27,315	150,730	221,540
U. S. Steel Corpn. shipments (tons)[h]	624,497	547,794	378,023	4,426,856	4,726,290
Ohio River steel shipments (net tons)[i]	.....	77,464	45,840	442,277	.....
Fabricated Products:					
Automobile production, U. S. and Canada[k]	178,166*	390,118	244,715	2,317,109	2,901,755[e]
Construction contracts, 37 Eastern States[l]	$168,557,200	$159,249,900	$119,591,800	$1,093,356,000	$1,024,313,900
Steel barrel shipments (number)[d]	.....	.....	364,081	4,798,839	.....
Steel furniture shipments (dollars)[d]	.....	.....	1,101,469	8,801,619	.....
Steel boiler orders (sq. ft.)[d]	.....	519,061	565,843	2,858,961	.....
Locomotive orders (number)[m]	0	5	5	88	21
Freight car orders (number)[m]	100	500	113	22,996	7,183
Machine tool index[n]	125.8	119.8	41.4	†37.1	†112.2
Foundry equipment index[o]	.....	93.3	43.1	†54.7	.....
Foreign Trade:					
Total iron and steel imports (gross tons)[p]	.....	31,894	32,418	217,732	.....
Imports of pig iron (gross tons)[p]	.....	5,519	18,418	86,801	.....
Imports of all rolled steel (gross tons)[p]	.....	18,719	10,910	77,790	.....
Total iron and steel exports (gross tons)[p]	.....	296,802	242,947	1,729,307	.....
Exports of all rolled steel (gross tons)[p]	.....	83,171	81,928	651,320	.....
Exports of finished steel (gross tons)[p]	.....	68,129	71,779	565,531	.....
Exports of scrap (gross tons)[p]	.....	205,779	1,025	29,160	.....
British Production:					
British pig iron production (gross tons)[r]	543,400	547,300	503,300	3,930,000	4,262,700
British steel ingot production (gross tons)[r]	759,900	803,300	667,000	5,892,500	6,364,400
Non-Ferrous Metals:					
Lead production (net tons)[s]	.....	34,424	27,328	272,906	.....
Lead shipments (net tons)[s]	.....	34,575	33,606	241,529	.....
Zinc production (net tons)[t]	35,922	35,055	26,169	234,933	280,964
Zinc shipments (net tons)[t]	39,200	32,241	21,663	238,525	286,524
Deliveries of tin (gross tons)[v]	5,320	5,290	4,045	30,065	39,000

*Preliminary. †Three Months' Average.

Source of figures: [a] Lake Superior Iron Ore Association; [b] Bureau of Mines; [c] THE IRON AGE; [d] Bureau of the Census; [e] American Iron and Steel Institute; [f] National Association of Flat-Rolled Steel Manufacturers; [g] American Institute of Steel Construction; [h] United States Steel Corpn.; [i] United States Engineer, Pittsburgh; [k] When preliminary, from Automobile Manufacturers Association—Final figures from Bureau of the Census; [l] F. W. Dodge Corpn.; [m] *Railway Age;* [n] National Machine Tool Builders Association; [o] Foundry Equipment Manufacturers Association; [p] Department of Commerce; [r] British Iron and Steel Federation; [s] American Bureau of Metal Statistics; [t] American Zinc Institute, Inc.; [v] New York Commodities Exchange.

SUMMARY OF THIS WEEK'S BUSINESS

Ingot Output in Slight Recession; Pig Iron Contracting Is Heavy

Mill Operations Are Sensitive, Reflecting the Delay in Automotive Buying and The Decline in Tin Plate Production—Bolt and Nut Prices Reduced

STEEL ingot production has dipped one-half point to 52 per cent of capacity. Operations have risen two points to 66 per cent in the Cleveland-Lorain district and three points to 41 per cent at Buffalo, but have fallen one point to 44 per cent at Pittsburgh, one point to 38 per cent in eastern Pennsylvania, three points to 57 per cent in the Valleys and five points to 90 per cent at Detroit. Output is substantially unchanged elsewhere, with the important Chicago district holding at 60 per cent and the Wheeling area at 80 per cent.

The deflection of operations apparently has little significance beyond reflecting the extreme sensitiveness of rolling schedules to the flow of orders. Buying is still predominantly at short range and shipping releases ordinarily pile up as the week advances, causing actual output to exceed scheduled operations. Thus, by the end of last week Chicago's scheduled rate of 60 per cent had been raised to 61 per cent.

Stocking of ingots by producers has been at a minimum. Anticipatory buying on account of changes in extras and prices has not yet materially affected mill schedules, though an accumulation of last-minute orders may result in a spurt in operations late in the month.

IN its broad trend, however, the immediate future of steel production is largely dependent on the automobile industry. Motor car makers have encountered unexpected delays in making the transition from old to new models, with the result that steel orders are still confined to relatively small lots. Parts makers are now specifying liberally and past experience indicates that car manufacturers themselves will order freely as soon as they get their production machinery working smoothly again.

Tin plate output has dropped to 55 per cent in line with seasonal expectations. Sheet mills are maintaining operations at 70 per cent, strip mills at 45 per cent and pipe mills at 40 to 45 per cent. Wire production has advanced from 45 to 50 per cent. Chicago rail mills have booked sufficient additional tonnage to warrant the extension of restricted rolling schedules until mid-October.

PIG IRON buying for fourth quarter is active in most market centers. Chicago producers have accumulated the largest backlogs since pre-depression years. Lake Erie furnaces have the heaviest bookings in two years. A Massachusetts textile machinery maker has closed for 10,000 tons.

Pig iron shipments continue to gain, those of Lake Erie producers being 40 per cent larger than for the corresponding period in August. A merchant furnace at Erie, Pa., out of blast for five years, is being blown in this week. A steel company has lighted a stack at Braddock, Pa., which will run largely on production for the merchant trade.

The pig iron market draws part of its strength from renewed threats of a coal strike.

SCRAP, as measured by THE IRON AGE composite for heavy melting steel prices at Pittsburgh, Chicago and Philadelphia, is unchanged at $12.75 a gross ton. Though the upward trend of scrap prices has been arrested it has not been completely stopped, further advances in heavy melting grade having occurred at Cleveland, Buffalo and Boston.

Structural steel lettings of 14,750 tons compare with 25,650 tons a week ago. Awards of structural steel, plate work, reinforcing and sheet piling reported by THE IRON AGE to date this year are maintaining a small margin over 1934, the total for this year being 882,807 tons and that for the corresponding period last year 878,667 tons.

Highway and grade separation projects are expected to be expedited by the removal of the restriction limiting Federal allotments to $1,400 per worker.

Machine, carriage, lag and plow bolts and nuts have been reduced in price 2 to 3 per cent through an increase in discount to 75 per cent off list. Tire bolts have been advanced to 60 per cent off list, and elevator, ribbed carriage and step bolts to 70 per cent off, these heretofore having carried an additional five-point discount. Discounts also have been cut on cap and set screws.

THE IRON AGE composite prices for pig iron and finished steel are unchanged at $17.84 a gross ton and 2.124c. a lb. respectively.

A Comparison of Prices

Market Prices at Date, and One Week, One Month, and One Year Previous; Advances Over Past Week in Heavy Type, Declines in Italics

Pig Iron

Per Gross Ton:	Sept. 17, 1935	Sept. 10, 1935	Aug. 20, 1935	Sept. 18, 1934
No. 2 fdy., Philadelphia	$20.3132	$20.3132	$20.3132	$20.26
No. 2, Valley furnace	18.50	18.50	18.50	18.50
No. 2 Southern, Cin'ti	19.2007	19.2007	19.2007	19.13
No. 2, Birmingham†	14.50	14.50	14.50	14.50
No. 2 foundry, Chicago*	18.50	18.50	18.50	18.50
Basic, del'd eastern Pa	19.8132	19.8132	19.8132	19.76
Basic, Valley furnace	18.00	18.00	18.00	18.00
Malleable, Chicago*	18.50	18.50	18.50	18.50
Malleable, Valley	18.50	18.50	18.50	18.50
L. S charcoal, Chicago	24.2528	24.2528	24.2528	24.04
Ferromanganese, seab'd carlots	85.00	85.00	85.00	85.00

†This quotation is for delivery in South; in the North prices are 38c. a ton under delivered quotations from nearest Northern furnace.

*The switching charge for delivery to foundries in the Chicago district is 60c. per ton.

Rails, Billets, etc.

Per Gross Ton:				
Rails, heavy, at mill	$36.37½	$36.37½	$36.37½	$36.37½
Light rails, Pittsburgh	35.00	35.00	35.00	35.00
Rerolling billets, Pittsburgh	27.00	27.00	27.00	27.00
Sheet bars, Pittsburgh	28.00	28.00	28.00	28.00
Slabs, Pittsburgh	27.00	27.00	27.00	27.00
Forging billets, Pittsburgh	35.00	35.00	35.00	32.00
Wire rods, Pittsburgh	38.00	38.00	38.00	38.00
	Cents	Cents	Cents	Cents
Skelp, grvd. steel, P'gh, lb.	1.70	1.70	1.70	1.70

Finished Steel

Per Lb.:	Cents	Cents	Cents	Cents
Bars, Pittsburgh	1.80	1.80	1.80	1.80
Bars, Chicago	1.85	1.85	1.85	1.85
Bars, Cleveland	1.85	1.85	1.85	1.85
Bars, New York	2.15	2.15	2.15	2.13
Plates, Pittsburgh	1.80	1.80	1.80	1.80
Plates, Chicago	1.85	1.85	1.85	1.85
Plates, New York	2.09	2.09	2.09	2.08
Structural shapes, Pittsburgh	1.80	1.80	1.80	1.80
Structural shapes, Chicago	1.85	1.85	1.85	1.85
Structural shapes, New York	2.06¼	2.06¼	2.06¼	2.05¼
Cold-finished bars, Pittsburgh	1.95	1.95	1.95	2.10
Hot-rolled strips, Pittsburgh	1.85	1.85	1.85	1.85
Cold-rolled strips, Pittsburgh	2.60	2.60	2.60	2.60

Finished Steel

Per Lb.:	Sept. 17, 1935 Cents	Sept. 10, 1935 Cents	Aug. 20, 1935 Cents	Sept. 18, 1934 Cents
Hot-rolled annealed sheets, No. 24, Pittsburgh	2.40	2.40	2.40	2.40
Hot-rolled annealed sheets, No. 24, Gary	2.50	2.50	2.50	2.50
Sheets, galv., No. 24, P'gh	3.10	3.10	3.10	3.10
Sheets, galv., No. 24, Gary	3.20	3.20	3.20	3.20
Hot-rolled sheets, No. 10, P'gh	1.85	1.85	1.85	1.85
Hot-rolled sheets, No. 10, Gary	1.95	1.95	1.95	1.95
Wire nails, Pittsburgh	2.40	2.40	2.60	2.60
Wire nails, Chicago dist. mill	2.45	2.45	2.65	2.65
Plain wire, Pittsburgh	2.30	2.30	2.30	2.30
Plain wire, Chicago dist. mill	2.35	2.35	2.35	2.35
Barbed wire, galv., P'gh	2.80	2.80	3.00	3.00
Barbed wire, galv., Chicago dist. mill	2.85	2.85	3.05	3.05
Tin plate, 100 lb. box, P'gh	$5.25	$5.25	$5.25	$5.25

Scrap

Per Gross Ton:	Sept. 17, 1935	Sept. 10, 1935	Aug. 20, 1935	Sept. 18, 1934
Heavy melting steel, P'gh	$13.25	$13.25	$13.00	$10.75
Heavy melting steel, Phila	12.50	12.50	11.75	9.50
Heavy melting steel, Ch'go	12.50	12.50	12.75	8.50
Carwheels, Chicago	12.75	12.75	12.75	9.50
Carwheels, Philadelphia	11.75	11.75	11.25	11.25
No. 1 cast, Pittsburgh	14.25	14.25	14.00	11.75
No. 1 cast, Philadelphia	11.75	11.75	11.25	11.75
No. 1 cast, Ch'go (net ton)	11.25	11.25	11.00	8.00
No. 1 RR. wrot., Phila	12.25	12.25	10.25	11.25
No. 1 RR. wrot., Ch'go (net)	9.50	9.50	9.50	6.75

Coke, Connellsville

Per Net Ton at Oven:				
Furnace coke, prompt	$3.25	$3.25	$3.25	$3.85
Foundry coke, prompt	4.00	4.00	4.00	4.60

Metals

Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Electrolytic copper, refinery	8.75	8.25	8.25	8.75
Lake copper, New York	9.12½	8.62½	8.62½	9.12½
Tin (Straits), New York	49.50	48.25	50.75	51.37½
Zinc, East St. Louis	4.60	4.60	4.60	4.00
Zinc, New York	4.97½	4.97½	4.97½	4.35
Lead, St. Louis	4.20	4.20	4.10	3.55
Lead, New York	4.35	4.35	4.25	3.70
Antimony (Asiatic), N. Y.	13.50	13.00	13.00	8.75

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our detailed price tables.

The Iron Age Composite Prices

	Finished Steel	Pig Iron	Steel Scrap
Sept. 17, 1935	2.124c. a Lb.	$17.84 a Gross Ton	$12.75 a Gross Ton
One week ago	2.124c.	17.84	12.75
One month ago	2.124c.	17.84	12.50
One year ago	2.124c.	17.90	9.58
	Based on steel bars, beams, tank plates, wire, rails, black pipe, sheets and hot-rolled strips. These products make 85 per cent of the United States output.	Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Birmingham.	Based on No. 1 heavy melting steel quotations at Pittsburgh, Philadelphia and Chicago.

	Finished Steel High	Finished Steel Low	Pig Iron High	Pig Iron Low	Steel Scrap High	Steel Scrap Low
1935	2.124c., Jan. 3	2.124c., Jan. 8	$17.90, Jan. 8	$17.83, May 14	$12.75, Sept. 10	$10.33, April 23
1934	2.199c., April 24	2.008c. Jan. 2	17.90, May 1	16.90, Jan. 27	13.00, Mar. 13	9.50, Sept. 25
1933	2.015c., Oct. 3	1.867c., April 18	16.90, Dec. 5	13.56, Jan. 3	12.25, Aug. 8	6.75, Jan. 3
1932	1.977c., Oct. 4	1.926c., Feb. 2	14.81, Jan. 5	13.56, Dec. 6	8.50, Jan. 12	6.43, July 5
1931	2.037c., Jan. 13	1.945c., Dec. 29	15.90, Jan. 6	14.79, Dec. 15	11.33, Jan. 6	8.50, Dec. 29
1930	2.273c., Jan. 7	2.018c., Dec. 9	18.21, Jan. 7	15.90, Dec. 16	15.00, Feb. 18	11.25, Dec. 9
1929	2.317c., April 2	2.273c., Oct. 29	18.71, May 14	18.21, Dec. 17	17.58, Jan. 29	14.08, Dec. 3
1928	2.286c., Dec. 11	2.217c., July 17	18.59, Nov. 27	17.04, July 24	16.50, Dec. 31	13.08, July 2
1927	2.402c., Jan. 4	2.212c., Nov. 1	19.71, Jan. 4	17.54, Nov. 1	15.25, Jan. 11	13.08, Nov. 22

Operations Dip in Tri-State Area

Pittsburgh Rate Slips to 44 Per Cent and Valley Average Falls to 57 Per Cent — Coal Strike Again Threatened

PITTSBURGH, Sept. 17.—Steel ingot output in the Pittsburgh district has slipped one point to 44 per cent of capacity. A minor decline of three points also has been sustained in the Valleys and nearby northern Ohio mills, which are scheduled at 57 per cent. Output in the Wheeling district is holding at around 80 per cent.

The slight loss in the Pittsburgh area is due chiefly to suspension of operations at a small independent mill. Other producers expect to maintain the pace of last week's operations.

The drop at Pittsburgh is not considered significant, since it is becoming increasingly the policy to gait raw steel production as closely as possible with finished steel demand. In only one instance has stocking of ingots gotten out of proportion with ultimate steel demand. Shipments, on a whole, are fairly well in step with operating schedules at most finishing mills, which, excepting in the case of tin plate, are holding their own.

Tin plate output is off a few points to 55 per cent, while sheet production is holding at about 70 per cent and strip at about 45 per cent. Pipe production in this district is holding at 40 to 45 per cent.

Further threats of a bituminous coal strike have had little direct influence upon steel demand thus far, although recent developments foreshadow more serious results unless settlement between operators and miners is reached by the deadline at the close of this week.

Bolt and nut discounts have been revised for fourth quarter, resulting in a slight average reduction.

Pig Iron

The threat of a coal strike has failed to influence consumer demand for pig iron. Volume is well maintained, but buying continues almost entirely in small lots for quick shipment. River movement is on a moderate scale. The Carnegie Steel Co. has lighted a stack at Braddock, Pa., which will run largely on production for the merchant trade. Another furnace at that point will be rehabilitated and later will produce ferromanganese. Prices appear to be firm, but little interest thus far has developed in fourth quarter quotations.

Semi-Finished Steel

Despite a diminishing movement of sheet bars for tin plate conversion, aggregate volume of semi-finished grades is unchanged. The demand for skelp, forging billets and sheet bars for detached sheet mills is notably steady.

Bolts, Nuts and Rivets

For the fourth quarter the discount on machine, carriage, lag and plow bolts, and hot-pressed and cold-pressed and semi-finished hexagon nuts will be 75 per cent off, instead of the present discounts of 70, 10 and 5. The new schedule represents a slight average reduction. The discount for small rivets will remain unchanged at 70 and 5. Large rivets have been reaffirmed at $2.90, base per 100 lb., Pittsburgh or Cleveland. Specifications are for immediate needs and are in relatively small volume.

Rails and Track Acessories

Current prices of $2.40 for spikes, $1.90 for tie plates, and $3.55 for track bolts, base per 100 lb., have been reaffirmed for fourth quarter delivery. Railroads are buying only against normal track maintenance requirements. Interest is centered in the prospective large scale inquiries for rails and fastenings reported ready to be broadcast by the Norfolk & Western.

Reinforcing Steel

More road work is appearing, but mills do not expect to benefit materially through reinforcing bar requirements, owing to the lateness of the season in Northern sections. Bids will be opened this week at Harrisburg on two sections of road in Butler and Indiana counties, the reinforcing bar requirements of which are indefinite. Price developments are lacking, and the Pittsburgh base of 2.05c. quoted by distributers is still subject to concessions.

Cold-Finished Bars

Demand continues to be unusually well diversified. The new extras to become applicable on Oct. 1 are driving in a considerable amount of jobber business. Anticipatory demand, coupled with prospects of increased automotive specifications before the close of the month, are prompting forecasts of a 50 per cent increase in September volume over that for August.

Tubular Products

Orders for practically all classes of pipe in the past week indicate a fairly steady demand in ultimate consuming fields. Demand from the oil fields still accounts for the lion's share of pipe shipments. On the whole, pipe production is largely unchanged, with some units striking an average of as high as 50 per cent, with the district running more nearly at 40 to 45 per cent.

Bars

The widening of the base bracket, announced by the Carnegie Steel Co. last week, will react favorably to some cold finishing companies, which could not have benefited measurably by the previous base bracket set up by Carnegie several weeks ago. Heavier individual bar orders are becoming more numerous as a result of the new quantity deductions, but there still is little evidence of anticipatory coverage by small buyers who will have to absorb the increased quantity and size extras to be applicable for fourth quarter. Encouraging to producers, in the face of recent changes, is the steady flow of business from miscellaneous sources.

Wire Products

Thus far September is making a strong bid for tonnage honors during third quarter. Although a moderate share of recent orders represents anticipatory coverage, demand, on a whole, appears to be chiefly for immediate or early consumer requirements. Shipments of manufacturers' wire are running a good deal heavier than those of merchant items, although the latter class of goods is showing a little pickup. Wire mill operations in this district are holding at 45 to 50 per cent.

Sheets

A gain in automotive orders has offset a slight decline in miscellaneous tonnage, and the sheet in-

dustry this week probably will maintain its recent average production of 70 per cent. The improvement in orders from the automotive industry in the past week appears to be the beginning of expanding orders against new model requirements, and some producers here expect the movement to gain momentum toward the close of September. Galvanized mills continue to operate at a high rate, orders for roofing being frequent in anticipation of the elimination of the jobber allowance on Oct. 1. All current base prices are quotable for fourth quarter delivery, and at this writing no further revisions in quantity, size extras or jobber allowances are in early prospect.

Tin Plate

Minor curtailment at some units this week will force the average output for the industry down a few points to 55 per cent. The seasonal trend now in force is expected to push production to lower levels, but a stop-gap may be provided if the warm weather now prevailing favorably affects tomato crops over the next month. In the event that the tomato pack be materially increased, some heavy stocks of tin plate in producers' hands may move more rapidly than expected, and operations would logically benefit from such freer movement. The present base price of $5.25 per 100 lb. box, Pittsburgh, will apply to shipments through this year. Although based on present conditions, no change in the present price appears likely for the coming year, circumstances possibly in the making, including inevitably higher fuel costs and the possibility of international conflict that would affect supplies of pig tin, stand in the way of definite predictions.

Tin mill black plate, No. 28 gage, is quotably unchanged for fourth quarter at 2.75c. a lb., Pittsburgh.

Strip Steel

Miscellaneous tonnage is holding its own, while automobile tonnage has not yet swelled measurably, as expected. Orders from stamping plants are in greater evidence, but large-lot buying for new model construction has not reached producers in this district. Hot and cold-rolled production is on an even keel, with output for the strip industry still averaging around 45 per cent. Talk of any possible changes in strip prices has been singularly lacking. Nevertheless, according to trade opinion, the establishing of a quantity extra and deduction list, similar to that initiated on hot-rolled carbon bars, at some time after the turn of the year, would not be surprising.

Coal and Coke

The hub of activity is in domestic-sized fuels, the movement of which is exceeding expectations this early in the current season. The extremely small amount of buying of domestic fuels during July and August now is reflecting favorably to suppliers. By contrast, demand for industrial bituminous coal is extremely poor. Most large consumers are under contract, and contingency buying, for the time being, appears to be out of the picture, despite continued threats of a bituminous strike. Prices have assumed a semblance of stability, probably owing chiefly to talk of labor strife. The coke market, excepting for domestic sizes, is dull, with prices holding unchanged.

Plates and Shapes

The United States Engineer Office, Pittsburgh, is expected to take bids soon on several barges that would require at least 400 tons of plates and shapes. Demand for plates from other quarters is rather limited, the absence of new railroad equipment building being a notable drawback. Recent Naval awards failed to add a great deal to order books here.

Structural steel awards reported for the past week were mainly for small projects, although one or two large jobs, including 3000 tons for International Harvester Co. buildings, were placed. The Independent Bridge Co. received the contract for 665 tons for a lock and dam on the Allegheny River at Rimerton, Pa.

Scrap

With this month's railroad lists largely out of the way, activity has dwindled to unimportant small-lot transactions. Interest in scrap among the steel mills is at a minimum. Nevertheless the entire market has not relinquished its firm tone of recent weeks. A steadying influence has been the extremely slow flow of scrap from producing sources. Another buoyant factor was the high prices paid against the recent railroad lists. On the Pennsylvania list No. 1 heavy melting steel is reported to have been sold at $14.50 to $14.60, and scrap rails, 3 ft. and longer, at $14.50 to nearly $15. A small independent mill has purchased around 13,000 tons of railroad quality No. 1 heavy melting steel at a reported price of around $14.50. Shipments to another small independent steel producer have been suspended.

The Leipzig Trade Fair, just concluded, indicated a vigorous recovery of business in many fields. The fair was attended by 125,000 business men from 74 countries, including the United States, and comprised 5200 exhibits assembled from 22 countries, showing gains over the fall fairs of several past years.

Weekly Indications of Steel Activity

From The Iron Age

	Sept. 17, 1935	Sept. 10, 1935	Aug. 20, 1935	Sept. 18, 1934	Average Year to Date 1935	Average Year to Date 1934
Steel ingot operations—Per cent of capacity	52.0	52.5	50.5	21.0	46.1	40.5

	Week Ended Sept. 17, 1935	Sept. 10, 1935	Aug. 20, 1935	Sept. 18, 1934	Year to Date 1935	Year to Date 1934
Fabricated structural steel awards	14,750	25,650	23,608	17,650	503,905	584,570
Fabricated plate awards	2,695	1,210	8,875	1,505	103,927	95,142
Sheet steel piling awards	0	7,500	0	160	44,115	42,800
Reinforcing bar awards	5,810	3,510	5,955	2,850	230,860	156,155

Chicago Output Sustained At 60 Per Cent

Implement Industry Again Expanding Production and Miscellaneous Steel Demand Improves—Pig Iron Bookings Reach New High Level

CHICAGO, Sept. 17.—The forward march of the Chicago district steel and iron market is uninterrupted. Even rail mills have benefited, miscellaneous bookings having added about three weeks to rolling schedules. Ingot output starts the new week at 60 per cent of capacity, unchanged from a week ago. However, before last week closed an advance of one point to 61 per cent of capacity had been made. It is a characteristic of the receipt of releases that they tend to pile up as each week advances.

Specifications for structural shapes are showing marked improvement and bars are moving in exceptionally good volume. Several weeks ago there were signs that miscellaneous demand might have reached its peak, but all such indications have now been erased and the needs of small users are again pushing to higher levels. One of the brightest spots in the Middle West is the agricultural implement industry, which is again expanding production schedules and which looks forward with assurance to the future.

Although railroad business is small, there are encouraging signs as to the future. Car loadings are up and the first signs of a shortage of cars used for bulk loadings are at hand. Scrap is hurried on track, with the empty cars consigned without delay to coal fields. The thought is put forward by some in the industry that car buying programs will be well shaped early in the new year.

Pig Iron

Books have reached the highest level of the depression and new contracts are coming in daily. There is some speculative tonnage, but sellers feel that the bulk of new orders is very close to what consumers feel will be their actual needs until the end of the year. Shipments continue to gain and September is on the way to establish a new high since the summer lull.

Cast Iron Pipe

All eyes are turned on Washington and as news comes from there apprehension grows concerning how Federal money will be spent. There seems to be a stronger current in the direction of spending for labor rather than for materials. Ann Arbor, Mich., has awarded the general contract for 250 tons, but it may be several months before the order for the pipe is placed.

Reinforcing Bars

The State of Indiana is out with a new inquiry for 600 tons of mesh for road work. Contractors in Illinois are still trying to get concrete information on the overhead crossing program, which has now grown to 175 separate projects. Some preliminary planning has been done on four elevated highways that will radiate from Chicago. If plans carry through, there will be built 12½ miles which may take as high as 70,000 tons of bars. Fresh inquiries are again starting to climb and their average size, though still small as gaged by old standards, is also growing. Prices are still the subject of comment because of their inability to gain real stability.

Rails

Several small lots have been placed by railroads and the aggregate tonnage closely balances shipments in recent weeks. The result is that rolling schedules have been advanced to about the middle of October. This represents a gain of three production weeks. Accessory business is light except for such track supplies as are needed for the rails that are being taken on current shipments.

Wire Products

Output has moved up to 50 per cent of capacity. This gain follows the expected trend, but it is not as rapid as it should be at this time of year. Disappointment is keenest with regard to the jobbing trade, which is not responding. There are several reasons for this. In the first place, the wire industry is not wholly together on the new price set-up. Secondly, there is some dissatisfaction among jobbers with the new price arrangement. Another point is that there is a hint that prices are not so stable as they should be. Then again there is the matter of jobbers' stocks, which are well balanced. Real support from the automobile industry is expected to develop next month. Wire rod policies are not yet determined and there is growing sentiment in favor of carrying prices forward as they now stand.

Sheets

Demand for sheet mill products is growing, and some units in this district are producing at capacity. Miscellaneous use remains on an even keel. Increased shipments are moving to agricultural implement manufacturers, automobile plants and the jobbing trade. Prices are well established.

Plates

Mills are benefiting from recent structural business, which has shown substantial growth. The bulk of the tonnage, however, is in the lighter gages that are close to the sheet classification. The railroad equipment market is quiet in the matter of actual business, but noisy from the viewpoint of discussion. The steel trade points to the trouble railroads are now having in meeting some car requirements and to the fact that more railroad officials are being converted to the newest types of car construction. Steel men are confident that a real equipment program will be under way early in the new year.

Structural Material

Awards and inquiries are not large, but there is once again a fair scattering of private undertakings. In general, fabricating shops are in better condition than in August. Government rules covering overhead crossing programs have been relaxed so that more money can be spent for materials. Fabricators look for a rush of grade separation jobs during the closing three months of the year.

Bars

This commodity is moving in heavy volume, users being in the mood to take every possible advantage of the new price set-up. Forging bars have been particularly active. Bars are moving to agricultural implement manufacturers in larger volume, and one mill that more or less specializes in that class of business has the best schedule in its history. Miscellaneous

demand remains active and automobile parts makers are generally stepping up requirements.

Scrap

This market is drifting, but it appears to offer resistance to lower prices. Mills are reported to have turned down offers at $12.50 a ton, but their action is of small importance in view of the commitments they have. Dealers' trades in heavy melting steel easily bring $12.50 a ton and the railroads can still obtain close to $13 a ton, delivered consumers' yards. Close to 50,000 tons of scrap is on Chicago docks. There has been a small movement from docks to Chicago mills, and a cargo of borings has been sold for delivery to Cleveland. It is significant that railroads, after having sold scrap, rush deliveries in order to free their equipment for use in handling coal and other bulk commodities. Some scrap dealers are complaining that they are having difficulty in getting certain kinds of cars for loading scrap.

Large Iron Sale in New England

BOSTON, Sept. 17.—The Draper Co., Hopedale, Mass., has purchased 10,000 tons of iron from eight furnaces. This is the largest transaction in this territory in a long time. The company is reported to have approximately 10,000 tons of iron stocked. Some fourth quarter iron was sold to other consumers, and there were spot sales also.

One scrap exporter loading a part cargo of steel here is paying $9.75 a ton, delivered dock, for material, and no recent sale is reported for less than $9.50 a ton. The market therefore is 25c. a ton higher for No. 1 steel, while No. 2 steel is up as much in sympathy, although somewhat less active. Sellers of No. 1 steel say they have been offered $10 a ton, delivered dock, for large tonnages. A steamer with 6700 tons for Italy finally cleared last week, and the exporter will have a similar cargo next month. The part-cargo lot now loading is 2000 tons for Gdynia, Poland. At Providence, R. I., scrap exporting has been held up by barge loading for eastern Pennsylvania delivery, a rather slow process. When the eastern Pennsylvania order has been completed, accumulation of steel for export will be resumed at Providence. The American Steel & Wire Co., Worcester, Mass., has raised its offers for No. 1 steel from $9 a ton delivered to $9.25, and bundled skeleton from $7.50 a ton to $7.75. A Rhode Island mill has raised its offers for No. 1 steel from $8.50 a ton delivered to $9. Breakable cast continues to move to eastern Pennsylvania at $6 to $6.25 a ton, f.o.b. A sizable tonnage of cast iron has been sold to New England consumers at $9.25 to $10 a ton delivered. Almost no scrap is going to the Pittsburgh district.

Bids Opened on 3700 Tons of Bars on Coast

SAN FRANCISCO, Sept. 16.—The Los Angeles area is the bright spot on the Coast, due largely to the recent purchases of bars and structural steel by the Metropolitan Water District. A few scattered tonnages are being placed in the Northwest while the San Francisco district is marked by an absence of new work.

The Union Oil Co. has purchased 1167 tons of 12-in. steel pipe for a pipe line at Avila, Cal., from an unnamed bidder. An award of 330 tons of structural steel to Wallace Bridge & Structural Steel Co. for a state bridge in Cowlitz County, Wash., was the outstanding letting of the week. Bookings aggregated 1571 tons of structural steel and 1231 tons of reinforcing bars.

California Hardware Co. is low bidder on 3741 tons of bars for concrete reinforcement of Ballona Creek, for which the United States Engineers, Los Angeles, took bids. It is reported that bids are to be taken soon for tanks at Defiance, Ariz., requiring 1400 tons of plates.

The East Bay Municipal Utility District will open bids Sept. 25 at Oakland, Cal., for furnishing 450,000 sq. ft. of galvanized and welded steel wire fabric.

Despite the limited number of projects requiring major tonnages, jobbers' sales of minor tonnages have been in good aggregate volume. The export of scrap to the Orient continues to be about double that a year ago.

Detroit Scrap Prices Unchanged

DETROIT, Sept. 17.—After a week of drooping sentiment, the local scrap market has regained its former strength, although prices have not yet advanced. Scrap lists of automotive companies, which are being offered this week, indicate that car production will be turning upward shortly.

Reinforcing Steel

Awards 5810 Tons—New Projects 5500 Tons

AWARDS

Boston, 280 tons, Washington Irving school repairs, to Truscon Steel Co.

New York, 2100 tons, Queens approach to Triborough bridge, to Igoe Brothers.

Warren, Orange and Columbia Counties, N. Y., 925 tons, mesh for highways, to American Steel & Wire Co.

New York, 145 tons, Triborough bridge project, to Kalman Steel Corpn.

Chicago, 300 tons, Liquid Carbonic Co., to Concrete Engineering Co.

North Chicago, Ill., 115 tons, Abbott Laboratories, to Concrete Engineering Co.

Chicago, 100 tons, Griffiths Laboratories to Joseph T. Ryerson & Son.

State of Wyoming, 133 tons, bridges in four counties, to unnamed bidders.

State of Colorado, 239 tons, bridges in six counties, to unnamed bidders.

Seattle, 275 tons, dormitory at University of Washington, to Pacific Coast Steel Corpn.

King County, Wash., 100 tons, State paving, to an unnamed bidder.

Camarillo, Cal., 103 tons, attendants' quarters, to Soule Steel Co.

Eureka, Cal., 264 tons, Mad River dam, to Truscon Steel Co.

Panama Canal Zone, 725 tons, deformed billet bars, to Carroll-McCreary & Co., Inc.

NEW REINFORCING BAR PROJECTS

New York, 250 tons, first section Sixth Avenue subway, Fortieth to Forty-seventh Streets; bids by Board of Transportation Oct. 4.

New York, 100 tons of bars and mesh, extension of vehicular tunnel approach to George Washington bridge on Manhattan side; bids Oct. 11.

Atlantic City, N. J., 300 tons, post office.

State of Indiana, 600 tons, mesh for road slabs.

Benton Harbor, Mich., 350 tons, bridge; Wisconsin Bridge & Iron Co., general contractor.

Fond du Lac, Wis., 100 tons, post office; bids extended to Sept. 20.

Chicago, 235 tons, bridge on Torrence Avenue.

Meredosia, Ill., 165 tons, bridge.

Los Angeles, 3741 tons, material for United States Engineers, Proposal No. 509-36-30; California Hardware Co., low bidder.

Salinas, Cal., 105 tons, post office; bids soon.

Silvery Mayari Alloy Iron.—Bethlehem Steel Co., Bethlehem, Pa. A 24-page illustrated booklet, No. 54-B, containing pertinent facts for foundry and other users of silvery Mayari, a natural nickel-chromium iron with high silicon content. Although compiled expressly for the foundryman, it possesses essential information for the users of foundry products, who are interested in this alloy iron as the medium for high-test machinable castings of the better type.

Prices of Finished Steel and Iron Products

BARS, PLATES, SHAPES

Iron and Steel Bars

Soft Steel — *Base per Lb.*

F.o.b. Pittsburgh	1.80c.
F.o.b. Chicago	1.85c.
F.o.b. Gary	1.85c.
F.o.b. Duluth	1.95c.
Del'd Detroit	1.95c.
F.o.b. Cleveland	1.85c.
F.o.b. Buffalo	1.90c.
Del'd Philadelphia	2.11c.
Del'd New York	2.15c.
F.o.b. Birmingham	1.95c.
F.o.b. cars dock Gulf ports	2.20c.
F.o.b. cars Pacific ports	2.35c.

Rail Steel

(For merchant trade)

F.o.b. Pittsburgh	1.70c.
F.o.b. Chicago	1.75c.
F.o.b. Gary	1.75c.
F.o.b. Moline, Ill.	1.75c.
F.o.b. Cleveland	1.75c.
F.o.b. Buffalo	1.85c.
F.o.b. Birmingham	1.85c.
F.o.b. cars dock Gulf ports	2.10c.
F.o.b. cars dock Pacific ports	2.25c.

Billet Steel Reinforcing

(Straight lengths as quoted by distributers)

F.o.b. Pittsburgh	2.05c.
F.o.b. Chicago	2.10c.
F.o.b. Gary	2.10c.
Del'd Detroit	2.20c.
F.o.b. Cleveland	2.10c.
F.o.b. Youngstown	2.10c.
F.o.b. Buffalo	2.10c.
F.o.b. Birmingham	2.10c.
F.o.b. cars dock Gulf ports	2.45c.
F.o.b. cars dock Pacific ports	2.45c.

Rail Steel Reinforcing

(Straight lengths as quoted by distributers)

F.o.b. Pittsburgh	1.90c.
F.o.b. Chicago	1.95c.
F.o.b. Gary	1.95c.
F.o.b. Cleveland	1.95c.
F.o.b. Youngstown	1.95c.
F.o.b. Buffalo	1.95c.
F.o.b. Birmingham	1.95c.
F.o.b. cars dock Gulf ports	2.30c.
F.o.b. cars dock Pacific ports	2.30c.

Iron

F.o.b. Chicago	1.80c.
F.o.b. Terre Haute, Ind.	1.75c.
F.o.b. Louisville, Ky.	2.10c.
F.o.b. Danville, Pa.	1.80c.
F.o.b. Berwick, Pa.	1.70c.

Cold Finished Bars and Shafting*

Base per Lb.

F.o.b. Pittsburgh	1.95c.
F.o.b. Chicago	2.00c.
F.o.b. Gary	2.00c.
F.o.b. Cleveland	2.00c.
F.o.b. Buffalo	2.05c.
Del'd Detroit	2.15c.
Del'd eastern Michigan	2.20c.

* In quantities of 10,000 to 19,000 lb.

Fence and Sign Posts

Angle Line Posts

Base per Net Ton

F.o.b. Pittsburgh	$50.00
F.o.b. Chicago	50.00
F.o.b. Duluth	51.00
F.o.b. Cleveland	50.00
F.o.b. Birmingham	53.00
F.o.b. Houston, Orange, Beaumont, Galveston	59.00
F.o.b. Mobile	58.00
F.o.b. New Orleans, Lake Charles, Corpus Christi	59.00
F.o.b. cars dock Pacific ports	62.00

Plates

Base per Lb.

F.o.b. Pittsburgh	1.80c.
F.o.b. Chicago	1.85c.
F.o.b. Gary	1.85c.
Del'd Cleveland	1.995c.
F.o.b. Coatesville	1.90c.
F.o.b. Sparrows Point	1.90c.
Del'd Philadelphia	1.92c.
Del'd New York	2.09c.
F.o.b. Birmingham	1.95c.
F.o.b. cars dock Gulf ports	2.20c.
F.o.b. cars dock Pacific ports	2.25c.
Wrought iron plates, f.o.b. P'gh	3.20c.

Floor Plates

F.o.b. Pittsburgh	2.35c.
F.o.b. Chicago	2.40c.
F.o.b. Coatesville	2.45c.
F.o.b. cars dock Gulf ports	2.75c.
F.o.b. cars dock Pacific ports	3.90c.

Structural Shapes

Base per Lb.

F.o.b. Pittsburgh	1.80c.
F.o.b. Chicago	1.85c.
Del'd Cleveland	1.995c.
F.o.b. Buffalo	1.90c.
F.o.b. Bethlehem	1.90c.
Del'd Philadelphia	2.015c.
Del'd New York	2.0625c.
F.o.b. Birmingham (standard)	1.95c.
F.o.b. cars dock Gulf ports	2.20c.
F.o.b. cars dock Pacific ports	2.35c.

Steel Sheet Piling

Base per Lb.

F.o.b. Pittsburgh	2.15c.
F.o.b. Chicago	2.25c.
F.o.b. Buffalo	2.25c.
F.o.b. cars dock Gulf ports	2.60c.
F.o.b. cars dock Pacific ports	2.60c.

SHEETS, STRIP, TIN PLATE TERNE PLATE

Sheets

Hot Rolled

Base per Lb.

No. 10, f.o.b. Pittsburgh	1.85c.
No. 10, f.o.b. Gary	1.95c.
No. 10, del'd Detroit	2.05c.
No. 10, del'd Phila.	2.16c.
No. 10, f.o.b. Birmingham	2.00c.
No. 10, f.o.b. cars dock Pacific ports	2.40c.

Hot-Rolled Annealed

No. 24, f.o.b. Pittsburgh	2.40c.
No. 24, f.o.b. Gary	2.50c.
No. 24, del'd Detroit	2.60c.
No. 24, del'd Phila.	2.71c.
No. 24, f.o.b. Birmingham	2.55c.
No. 24, f.o.b. cars dock Pacific ports	3.05c.
No. 24, wrought iron, Pittsburgh	4.30c.

Heavy Cold-Rolled

No. 10 gage, f.o.b. Pittsburgh	2.50c.
No. 10 gage, f.o.b. Gary	2.60c.
No. 10 gage, del'd Detroit	2.70c.
No. 10 gage, del'd Phila	2.81c.
No. 10 gage, f.o.b. Birmingham	2.65c.
No. 10 gage, f.o.b. cars dock Pacific ports	3.10c.

Light Cold-Rolled

No. 20 gage, f.o.b. Pittsburgh	2.95c.
No. 20 gage, f.o.b. Gary	3.05c.
No. 20 gage, del'd Detroit	3.15c.
No. 20 gage, del'd Phila.	3.26c.
No. 20 gage, f.o.b. Birmingham	3.10c.
No. 20, f.o.b. cars dock Pacific ports	3.50c.

Galvanized Sheets

No. 24 gage, f.o.b. Pittsburgh	3.10c.
No. 24, f.o.b. Gary	3.20c.
No. 24, del'd Phila.	3.41c.
No. 24, f.o.b. Birmingham	3.25c.
No. 24, f.o.b. cars dock Pacific ports	3.70c.
No. 24, wrought iron, Pittsburgh	4.95c.

Long Ternes

No. 24, unassorted 8-lb. coating f.o.b. Pittsburgh	3.40c.
F.o.b. Gary	3.50c.
F.o.b. cars dock Pacific ports	4.10c.

Vitreous Enameling Stock

No. 20, f.o.b. Pittsburgh	3.10c.
No. 20, f.o.b. Gary	3.20c.
No. 20, f.o.b. Birmingham	3.70c.
No. 20, f.o.b. cars dock Pacific ports	3.70c.
No. 10, f.o.b. Pittsburgh	2.50c.
No. 10, f.o.b. Gary	2.60c.
No. 10, f.o.b. Birmingham	3.10c.
No. 10, f.o.b. cars dock Pacific ports	3.10c.

Tin Mill Black Plate

No. 28, f.o.b. Pittsburgh	2.75c.
No. 28, Gary	2.85c.
No. 28, cars dock Pacific Coast ports	3.35c.

Tin Plate

Per Base Box

Standard cokes, f.o.b. P'gh district mill	$5.25
Standard cokes, f.o.b. Gary	5.35
Standard cokes, f.o.b. cars dock Pacific ports	5.90

Terne Plate

(*F.o.b. Pittsburgh*)

(Per Package, 20 x 28 in.)

8-lb. coating I.C.	$10.00
15-lb. coating I.C.	12.00
20-lb. coating I.C.	13.00
25-lb. coating I.C.	14.00
30-lb. coating I.C.	15.25
40-lb. coating I.C.	17.50

Hot-Rolled Hoops, Bands, Strips and Flats under ¾ In.

Base per Lb.

All widths up to 24 in., P'gh	1.85c.
All widths up to 24 in., Chicago	1.95c.
All widths up to 24 in., del'd Detroit	2.05c.
All widths up to 24 in., Birmingham	2.00c.
Cooperage stock, Pittsburgh	1.95c.
Cooperage stock, Chicago	2.05c.

Cold-Rolled Strips

Base per Lb.

F.o.b. Pittsburgh	2.60c.
F.o.b. Cleveland	2.60c.
Del'd Chicago	2.895c.
F.o.b. Worcester	2.80c.

Fender Stock

No. 14, Pittsburgh or Cleveland	2.90c.
No. 14, Worcester	3.30c.
No. 20, Pittsburgh or Cleveland	3.30c.
No. 20, Worcester	3.70c.

Hot-Rolled Rail Steel Strips

Base per Lb.

F.o.b. Pittsburgh	1.70c.
F.o.b Chicago	1.75c.
F.o.b. Birmingham	1.85c.

WIRE PRODUCTS

(Carload lots, f.o.b. Pittsburgh and Cleveland.)

To Manufacturing Trade — *Per Lb.*

Bright wire	2.30c.
Spring wire	2.90c.

Chicago prices on products sold to the manufacturing trade are $1 a ton above Pittsburgh or Cleveland. Worcester and Duluth prices are $2 a ton above, Birmingham $3 above, and Pacific Coast prices $9 a ton above Pittsburgh or Cleveland.

To Large-Lot Buyers

Base per Keg

Standard wire nails	$2.40
Smooth coated nails	2.40

Base per 100 Lb.

Annealed fence wire	$2.45
Galvanized fence wire	2.80
Polished staples	3.10
Galvanized staples	3.35
Barbed Wire, galvanized	2.80
Twisted barbless wire	2.80
Woven wire fence, base column	58.00
Single loop bale ties, base column	53.00

Chicago and Anderson, Ind., mill prices are $1 a ton over Pittsburgh base (on all products except woven wire fence, for which the Chicago price is $2 above Pittsburgh); Duluth, Minn., and Worcester, Mass., mill prices are $2 a ton over Pittsburgh (except for woven wire fence at Duluth, which is $3 over Pittsburgh), and Birmingham mill prices are $3 a ton over Pittsburgh.

On wire nails, barbed wire, staples and fence wire, prices at Houston, Galveston and Corpus Christi, Tex., New Orleans, Lake Charles, La., and Mobile, Ala., are $6 a ton over Pittsburgh, while Pacific Coast prices are $8 over Pittsburgh. Exception: on fence wire Pacific Coast prices are $11 a ton above Pittsburgh.

On staples and barbed wire, prices of $6 a ton above Pittsburgh are also quoted at Beaumont and Orange, Tex.

Wire Hoops, Twisted or Welded

Off List

F.o.b. Pittsburgh	35 and 2½ off
F.o.b. Chicago	35 off

STEEL AND WROUGHT PIPE AND TUBING

Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills

F.o.b. Pittsburgh only on wrought iron pipe.

Butt Weld

Steel Inches	Steel Black	Steel Galv.	Wrought Iron Inches	Wrought Iron Black	Wrought Iron Galv.
⅛	51½	29½	⅛	+91½	+133
¼ to ⅜	53½	35	¼ & ⅜	+1½	+21½
½	58½	47	½	31½	15
¾	62	52	¾	36½	20½
1 to 3	64	55	1 & 1¼	39½	25½
			1½	42½	28
			2	41½	26

Lap Weld

2	60	51	2	37	23½
2½ to 3	63	54	2½ to 3½	38	25
3½ to 6	65	56	4 to 8	40	28½
7 and 8	64	54	9 to 12	38	24½
9 and 10	63½	53½			
11 and 12	62½	52½			

Butt Weld, extra strong, plain ends

⅛	48½	33½	⅛	+13	+45½
¼ to ⅜	51	36	¼ & ⅜	+2½	+34½
½	56½	47½	½	32½	17½
¾	61	52	¾	37½	22½
1 to 3	63	55	1 to 2	43½	29

Lap Weld, extra strong, plain ends

2	56	50	2	40	28
2½ to 3	62	54	2½ to 4	45½	33
3½ to 6	65½	57½	4½ to 6	45	33½
7 and 8	64½	54½	7 & 8	46	33
9 and 10	63½	53½	9 to 12	41½	30
11 and 12	62½	52½			

On standard steel pipe an extra 5% off is allowed on sales to consumers while two 5's off apply on sales to jobbers. On less-than-carload shipments prices are determined by adding 20 and 25% and the carload freight rate to the base card. On structural steel pipe the base card is reduced 2 points and two 5's off are allowed to consumers and three 5's off to jobbers.

Note—Chicago district mills have a base two points less than the above discounts. Chicago delivered base is 2½ points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point producing the lowest price to destination.

Boiler Tubes

Seamless Steel Commercial Boiler Tubes and Locomotive Tubes

(Net base prices per 100 ft. f.o.b. Pittsburgh, in carload lots)

		Cold Drawn	Hot Rolled
1 in. o.d.	13 B.W.G.	$ 5.60	$ 7.33
1¼ in. o.d.	13 B.W.G.	10.19	9.36
1½ in. o.d.	13 B.W.G.	11.36	10.23
1¾ in. o.d.	13 B.W.G.	12.81	11.64
2 in. o.d.	13 B.W.G.	14.85	12.94
2¼ in. o.d.	13 B.W.G.	16.00	14.54
2½ in. o.d.	12 B.W.G.	17.61	16.01
2½ in. o.d.	12 B.W.G.	19.29	17.54
2¾ in. o.d.	12 B.W.G.	20.45	18.59
3 in. o.d.	12 B.W.G.	21.45	19.50
4½ in. o.d.	10 B.W.G.	41.06	37.36
3½ in. o.d.	11 B.W.G.	27.09	24.63
4 in. o.d.	10 B.W.G.	33.00	30.54
4½ in. o.d.	10 B.W.G.	42.06	37.36
5 in. o.d.	9 B.W.G.	51.56	46.37
6 in. o.d.	7 B.W.G.	79.15	71.90

Extras for less-carload quantities:

25,000 lb. or ft. to 39,999 lb. or ft.	5 %
12,000 lb. or ft. to 24,999 lb. or ft.	12½ %
6,000 lb. or ft. to 11,999 lb. or ft.	25 %
2,000 lb. or ft. to 5,999 lb. or ft.	35 %
Under 2,000 lb. or ft.	50 %

Lapweld Steel and Knobbled Charcoal Iron Pressure Tubes

(Net base prices per 100 ft. f.o.b. Pittsburgh, in carload lots)

		Steel	Iron
1¼ in. o.d.	13 B.W.G.	$ 9.72	$10.14
1½ in. o.d.	13 B.W.G.	11.06	11.84
2 in. o.d.	13 B.W.G.	12.38	17.22
2¼ in. o.d.	13 B.W.G.	13.79	19.52
2½ in. o.d.	12 B.W.G.	16.58	24.19
2¾ in. o.d.	12 B.W.G.	17.54	26.46
3 in. o.d.	12 B.W.G.	18.35	28.39
3¼ in. o.d.	11 B.W.G.	21.54	33.95
3½ in. o.d.	11 B.W.G.	23.15	36.18
4 in. o.d.	10 B.W.G.	28.06	45.24
4½ in. o.d.	10 B.W.G.	35.22	56.48
5 in. o.d.	9 B.W.G.	44.25	61.84
6 in. o.d.	7 B.W.G.	68.14	102.46

Quantity Extras:

40,000 lb. or ft.	base
25,000 lb. or ft. to 39,999 lb. or ft.	plus 5%
10,000 lb. or ft. to 24,999 lb. or ft.	plus 12½ %
2,000 lb. or ft. to 9,999 lb. or ft.	plus 25%
Under 2,000 lb. or ft.	plus 40%

CAST IRON WATER PIPE

Per Net Ton

*6-in. and larger, del'd Chicago	$42.40
*4-in., del'd Chicago	51.40
6-in. and larger, del'd New York	45.20
4-in., del'd New York	48.20
*6-in. and larger, Birmingham	40.00
*4-in. Birmingham	43.00
6-in. and larger, f.o.b. dock, San Francisco or Los Angeles	48.00
F.o.b. dock, Seattle	48.50
4-in., f.o.b. dock, San Francisco or Los Angeles	51.00
F.o.b. dock, Seattle	51.50

Class "A" and gas pipe, $3 extra.

*Prices for lots of less than 200 tons. For 200 tons and over, 6-in. and larger is $39, Birmingham, and $47.40, delivered Chicago, and 4-in. pipe, $42, Birmingham, and $50.40 a ton, delivered Chicago.

RAILROAD MATERIALS

Rails and Track Supplies

F.o.b. Mill

Standard rails, heavier than 60 lb., per gross ton	$36.37½
Angle bars, per 100 lb.	2.55

F.o.b. Code Basing Points

Light rails (from billets) per gross ton	$35.00
Light rails (from rail steel) per gross ton	34.00

Base per 100 Lb.

Spikes, 9/16 in. and larger	$2.40
Spikes, ½ in. and smaller	2.40
Tie plates, steel	1.80
Tie plates, Pacific Coast ports	2.60
Track bolts, to steam railroads	3.50
Track bolts, to jobbers, all sizes (per 100 count)	70 per cent off list

Basing points on light rails are Pittsburgh, Chicago and Birmingham; on spikes and tie plates, Pittsburgh, Chicago, Buffalo, Portsmouth, Ohio, Weirton, W. Va., St. Louis, Kansas City, Minnequa, Colo., Birmingham and Pacific Coast ports; on tie plates alone, Steelton, Pa.; on spikes alone, Cleveland, Youngstown, Lebanon, Pa., Columbia, Pa., Richmond, Va.

BOLTS, NUTS, RIVETS AND SET SCREWS

Bolts and Nuts

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

Per Cent Off List

Machine bolts	75
Carriage bolts	75
Lag bolts	75
Plow bolts, Nos. 1, 2, 3 and 7 heads	75
Hot-pressed nuts, blank or tapped, square	75
Hot-pressed nuts, blank or tapped, hexagon	75
C.p.c. and t. square or hex. nuts, blank or tapped	75
Semi-finished hexagon nuts, U.S.S. and S.A.E., all sizes to and incl. 1 in. diameter	75
Larger than 1 in. diameter	75
Stove bolts in packages, Pittsburgh	75
Stove bolts in packages, Chicago	75
Stove bolts in packages, Cleveland	75
Stove bolts in bulk, Pittsburgh	83
Stove bolts in bulk, Chicago	83
Stove bolts in bulk, Cleveland	83
Tire bolts	60

Large Rivets

(½-in. and larger)

Base per 100 Lb.

F.o.b. Pittsburgh or Cleveland	$2.90
F.o.b. Chicago	3.00
F.o.b. Birmingham	3.05

Small Rivets

(7/16-in. and smaller)

Per Cent Off List

F.o.b. Pittsburgh	70 and 5
F.o.b. Cleveland	70 and 5
F.o.b. Chicago and Birm'g'm	70 and 5

Cap and Set Screws

(Freight allowed up to but not exceeding 65c. per 100 lb. on lots of 200 lb. or more)

Per Cent Off List

Milled cap screws, 1 in. dia. and smaller	80, 10 and 10
Milled standard set screws, case hardened, 1 in. dia. and smaller	75
Milled headless set screws, cut thread ¾ in. and smaller	75
Upset hex. head cap screws, U.S.S. or S.A.E. thread, 1 in. dia and smaller	85
Upset set screws, cut and oval points	75 and 10
Milled studs	65 to 65 and 10

Alloy and Stainless Steel

Alloy Steel Ingots

F.o.b. Pittsburgh, Chicago, Canton, Massillon, Buffalo, Bethlehem.
Uncropped .....$40 per gross ton

Alloy Steel Blooms, Billets and Slabs

F.o.b. Pittsburgh, Chicago, Canton, Massillon, Buffalo, Bethlehem.
Base price, $49 a gross ton.

Alloy Steel Bars

Price del'd Detroit is $52.

F.o.b. Pittsburgh, Chicago, Buffalo, Bethlehem, Massillon or Canton.

Open-hearth grade, base	2.45c.
Delivered price at Detroit is	2.60c.

S.A.E. Series Numbers	Alloy Differential per 100 lb.
2000 (½% Nickel)	$0.25
2100 (2½% Nickel)	0.55
2300 (3½% Nickel)	1.50
2500 (5% Nickel)	2.25
3100 Nickel Chromium	0.55
3200 Nickel Chromium	1.35
3300 Nickel Chromium	3.80
3400 Nickel Chromium	3.20
4100 Chromium Molybdenum (0.15 to 0.25 Molybdenum)	0.50
4100 Chromium Molybdenum (0.25 to 0.40 Molybdenum)	0.70
4600 Nickel Molybdenum (0.20 to 0.30 Molybdenum) (1.50 to 2.00 Nickel)	1.05
5100 Chromium Steel (0.60 to 0.90 Chromium)	0.35
5100 Chromium Steel (0.80 to 1.10 Chromium)	0.45
5100 Chromium Spring Steel	base
6100 Chromium Vanadium Bar	1.20
6100 Chromium Vanadium Spring Steel	0.70
Chromium Nickel Vanadium	1.50
Carbon Vanadium	0.95

These prices are for hot-rolled steel bars. The differential for most grades in electric furnace steel is 50c. higher. The differential for cold-drawn bars ½c. per lb. higher with separate extras. Blooms, billets and slabs under 4x4 in. or equivalent are sold on the bar base. Slabs with a section area of 16 in. and 2½ in. thick or over take the billet base. Sections 4x4 in. to 10x10 in. or equivalent carry a gross ton price, which is the net price for bars for the same analysis. Larger sizes carry extras.

Alloy Cold-Finished Bars

F.o.b. Pittsburgh, Chicago, Gary, Cleveland or Buffalo. 2.95c. base per lb.

STAINLESS STEEL No. 302

(17 to 19% Cr. 7 to 9% NI. 0.08 to 0.20% C.)

(Base Prices f.o.b. Pittsburgh)

	Per Lb.
Forging billets	19.55c.
Rerolling slabs	15c.
Bars	23c.
Plates	26c.
Structural shapes	23c.
Sheets	33c.
Hot-rolled strip	20¾c.
Cold-rolled strip	27c.
Drawn wire	23c.

Raw and Semi-Finished Steel

Carbon Steel Rerolling Ingots

F.o.b. Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham.
Uncropped .....$29 per gross ton

Carbon Steel Forging Ingots

F.o.b. Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Birmingham.
Uncropped .....$31 per gross ton

Billets, Blooms and Slabs

F.o.b. Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham.

	Per Gross Ton
Rerolling	$27.00
Forging quality	35.00

Delivered Detroit

Rerolling	$30.00
Forging	38.00

Billets Only F.o.b. Duluth

Rerolling	$29.00
Forging	37.00

Sheet Bars

F.o.b. Pittsburgh, Chicago, Cleveland, Youngstown, Buffalo, Canton, Sparrows Point, Md.

	Per Gross Ton
Open-hearth or Bessemer	$28.00

Skelp

F.o.b. Pittsburgh, Chicago, Youngstown, Buffalo, Coatesville, Pa., Sparrows Point, Md.

	Per Lb.
Grooved	1.70c.
Universal	1.70c.
Sheared	1.70c.

Tube Rounds

	Base per Lb.
F.o.b. Pittsburgh	1.80c.
F.o.b. Chicago	1.85c.
F.o.b. Cleveland	1.85c.
F.o.b. Buffalo	1.90c.
F.o.b. Birmingham	1.95c.

Wire Rods

(Common, base)

	Per Gross Ton
F.o.b. Pittsburgh	$38.00
F.o.b. Cleveland	38.00
F.o.b. Chicago	39.00
F.o.b. Anderson, Ind.	39.00
F.o.b. Youngstown	39.00
F.o.b. Worcester, Mass.	40.00
F.o.b. Birmingham	41.00
F.o.b. San Francisco	47.00
F.o.b. Galveston	44.00

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Pig Iron and Ferroalloys

PIG IRON

PRICES PER GROSS TON AT BASING POINTS

Basing Points	No. 2 Fdry.	Malleable	Basic	Bessemer
Everett, Mass.	$19.50	$20.00	$19.00	$20.50
Bethlehem, Pa.	19.50	20.00	19.00	20.50
Birdsboro, Pa.	19.50	20.00	19.00	20.50
Swedeland, Pa.	19.50	20.00	19.00	20.50
Steelton, Pa.	....	....	19.00	....
Sparrows Point, Md.	19.50	....	19.00	....
Neville Island, Pa.	18.50	18.50	18.00	19.00
Sharpsville, Pa.	18.50	18.50	18.00	19.00
Youngstown	18.50	18.50	18.00	19.00
Buffalo	18.50	19.00	17.50	19.50
Erie, Pa.	18.50	19.00	18.00	19.50
Cleveland	18.50	18.50	18.00	19.00
Toledo, Ohio	18.50	18.50	18.00	19.00
Jackson, Ohio	20.25	20.25	19.75	20.75
Detroit	18.50	18.50	18.00	19.00
Hamilton, Ohio	18.50	18.50	18.00	19.00
Chicago	18.50	18.50	18.00	19.00
Granite City, Ill	18.50	18.50	18.00	....
Duluth, Minn.	19.00	19.00	....	19.50
Birmingham	14.50	14.50	13.50	19.00
Provo, Utah	17.50	....	17.00	....

DELIVERED PRICES PER GROSS TON AT CONSUMING CENTERS

	No. 2 Fdry.	Malleable	Basic	Bessemer
Boston Switching District				
From Everett, Mass.	$20.00	$20.50	$19.50	$21.00
Brooklyn				
From East. Pa.	21.9289	22.4289	21.9289	22.9289
Newark or Jersey City, N. J.				
From East. Pa.	20.9873	21.4873	20.4873	21.9873
Philadelphia				
From Eastern Pa.	20.3132	20.8132	19.8132	21.3132
Cincinnati				
From Hamilton, Ohio	19.5807	19.5807	19.0807	20.0807
Canton, Ohio				
From Cleveland and Youngstown	19.8402	19.8402	19.3402	20.3402
Columbus, Ohio				
From Hamilton, Ohio	20.64	20.64	....	....
Mansfield, Ohio				
From Cleveland and Toledo	20.3832	20.3832	....	....
Indianapolis				
From Hamilton, Ohio	20.9289	20.9289	....	....
South Bend, Ind.				
From Chicago	20.6935	20.6935	....	....
Milwaukee				
From Chicago	19.57	19.57	....	....
St. Paul				
From Duluth	20.94	....	....	....
Davenport, Iowa				
From Chicago	20.3832	20.3832	....	....
Kansas City				
From Granite City	21.2178	21.2178	....	....
San Francisco, Los Angeles or Seattle. From Provo	22.315	....	....	....

Delivered prices on Southern iron for shipment to Northern points are 38c. a gross ton below delivered prices from the nearest Northern basing points.

LOW PHOSPHORUS PIG IRON

Basing points: Birdsboro, Pa., Steelton, Pa., and Standish, N. Y. $23.50

GRAY FORGE PIG IRON

Valley furnace	$18.00
Pittsburgh district furnace	18.00

CHARCOAL PIG IRON

Lake Superior furnace	$21.00
Delivered Chicago	24.2528
Delivered Buffalo	24.595

CANADA

Pig Iron

Per gross ton:

Delivered Toronto

No. 1 fdy., sil. 2.25 to 2.75	$21.00
No. 2 fdy., sil. 1.75 to 2.75	20.50
Malleable	21.00

Delivered Montreal

No. 1 fdy., sil. 2.25 to 2.75	$22.50
No. 2 fdy., sil. 1.75 to 2.25	22.00
Malleable	22.50
Basic	22.00

FERROALLOYS

Ferromanganese

F.o.b. New York, Philadelphia, Baltimore, Mobile or New Orleans.

	Per Gross Ton
Domestic, 80% (carload)	$85.00

Spiegeleisen

	Per Gross Ton Furnace
Domestic, 19 to 21%	$26.00
50-ton lots 3-mo. shipment	24.00
F.o.b. New Orleans	26.00

Electric Ferrosilicon

	Per Gross Ton Delivered
50% (carloads)	$77.50
50% (ton lots)	82.00
75% (carloads)	126.00
75% (ton lots)	136.00

Silvery Iron

F.o.b. Jackson, Ohio, Furnace

Per Gross Ton		*Per Gross Ton*	
6%	$22.75	12%	$29.25
7%	23.75	13%	30.75
8%	24.75	14%	32.25
9%	25.75	15%	33.75
10%	26.75	16%	35.25
11%	27.75	17%	36.75

The lower all-rail delivered price from Jackson or Buffalo is quoted with freight allowed. Base prices at Buffalo are $1.25 a ton higher than at Jackson.

Manganese 2 to 3%, $1 a ton additional. For each unit of manganese over 3%, $1 a ton additional.

Bessemer Ferrosilicon

F.o.b. Jackson, Ohio, Furnace

Per Gross Ton		*Per Gross Ton*	
10%	$27.75	14%	$33.25
11%	28.75	15%	34.75
12%	30.25	16%	36.25
13%	31.75	17%	37.75

Manganese 2 to 3%, $1 a ton additional. For each unit of manganese over 3%, $1 a ton additional. Phosphorus 0.75% or over, $1 ton additional.

Base prices at Buffalo are $1.25 a ton higher than at Jackson.

Other Ferroalloys

Ferrotungsten, per lb. contained W. del., carloads	$1.35 to $1.45
Ferrotungsten, less carloads	1.45 to 1.55
Ferrochromium, 4 to 6% carbon and up, 65 to 70% Cr. per lb. contained Cr. delivered, in carloads	10.00c.
Ferrochromium, 2% carbon	16.50c. to 17.00c.
Ferrochromium, 1% carbon	17.50c. to 18.00c.
Ferrochromium, 0.10% carbon	19.50c. to 20.00c.
Ferrochromium, 0.06% carbon	20.00c. to 20.50c.
Ferrovanadium, del. per lb. contained V.	$2.70 to $2.90
Ferrocarbontitanium, 15 to 18% Ti, 6 to 8% C. f.o.b. furnace carload and contract per net ton	$137.50
Ferrophosphorus, electric, or blast furnace material, in carloads, 18%, Rockdale, Tenn., base, per gross ton with $2 unitage	50.00
Ferrophosphorus, electric, 24%, f.o.b. Anniston, Ala., per gross ton with $2.75 unitage	65.00
Ferromolybdenum, per lb. Mo., del.	95c.
Calcium molybdate, per lb. Mo., del.	80c.
Silico spiegel, per ton, f.o.b. furnace, carloads	$38.00
Ton lots or less, per ton	45.50
Silico-manganese, gross ton, delivered.	
2.50% carbon grade	90.00
2% carbon grade	95.00
1% carbon grade	105.00
Spot prices	$5 a ton higher

Iron and Steel Scrap

PITTSBURGH

Per gross ton delivered consumers' yards:

No. 1 heavy melting steel	$13.00 to $13.50
No. 2 heavy melting steel	12.00 to 12.50
No. 2 railroad wrought	13.50 to 14.00
Scrap rails	14.25 to 14.75
Rails, 3 ft. and under	15.00 to 15.50
Compressed sheet steel	13.00 to 13.50
Hand bundled sheet steel	12.00 to 12.50
Hvy. steel axle turnings	11.50 to 12.00
Machine shop turnings	9.50 to 10.00
Short shov. turnings	9.50 to 10.00
Short mixed borings and turnings	7.00 to 7.50
Cast iron borings	7.00 to 7.50
Cast iron carwheels	14.00 to 14.50
Heavy breakable cast	12.25 to 12.75
No. 1 cast	14.00 to 14.50
Railr. knuckles and couplers	15.00 to 15.50
Rail. coil and leaf springs	15.50 to 16.00
Rolled steel wheels	15.50 to 16.00
Low phos. billet crops	16.00 to 16.50
Low phos. sheet bar crops	15.50 to 16.00
Low phos. punchings	15.00 to 15.50
Low phos. plate scrap	14.50 to 15.00
Steel car axles	14.25 to 14.75

CHICAGO

Delivered Chicago district consumers:

	Per Gross Ton
Heavy melting steel	$12.25 to $12.75
Automobile hvy. melt. steel	11.25 to 11.75
Shoveling steel	12.25 to 12.75
Hydraulic comp. sheets	11.25 to 11.75
Drop forge flashings	9.50 to 10.00
No. 1 busheling	11.00 to 11.50
Rolled carwheels	12.75 to 13.25
Railroad tires	13.00 to 13.50
Railroad leaf springs	12.75 to 13.25
Axle turnings	11.00 to 11.50
Steel couplers and knuckles	13.25 to 13.75
Coil springs	14.25 to 14.75
Axle turnings (elec. fur.)	11.75 to 12.25
Low phos. punchings	14.50 to 15.00
Low phos. plates, 12 in. and under	14.50 to 15.00
Cast iron borings	6.00 to 6.50
Short shoveling turnings	7.50 to 8.00
Machine shop turnings	7.00 to 7.50
Reroiling rails	13.50 to 14.00
Steel rails, less than 3 ft.	13.50 to 14.00
Steel rails, less than 2 ft.	15.00 to 15.50
Angle bars, steel	14.00 to 14.50
Cast iron carwheels	12.75 to 13.25
Railroad malleable	14.75 to 15.25
Agricultural malleable	10.25 to 10.75

	Per Net Ton
Iron car axles	$15.50 to $16.00
Steel car axles	14.75 to 15.25
No. 1 railroad wrought	9.50 to 10.00
No. 2 railroad wrought	11.00 to 11.50
No. 2 busheling	6.50 to 7.00
Locomotive tires, smooth	11.50 to 12.00
Pipes and flues	7.00 to 7.50
No. 1 machinery cast	11.25 to 11.75
Clean automobile cast	10.50 to 11.00
No. 1 railroad cast	9.75 to 10.25
No. 1 agricultural cast	10.00 to 10.50
Stove plate	8.00 to 8.50
Grate bars	8.00 to 8.50
Brake shoes	8.00 to 8.50

PHILADELPHIA

Per gross ton delivered consumers' yards:

No. 1 heavy melting steel	$12.50
No. 2 heavy melting steel	$11.25 to 11.50
Hydraulic compressed, new	10.00 to 10.50
Hydraulic compressed, old	8.50 to 9.00
Steel rails for rolling	14.00 to 14.50
Cast iron carwheels	11.50 to 12.00
Heavy breakable cast	11.00 to 11.50
No. 1 cast	11.50 to 12.00
Stove plate (steel works)	9.00 to 9.50
Machine shop turnings	7.00 to 7.50
No. 1 blast furnace	5.00
Heavy axle turnings	9.50 to 10.00
Cast borings	5.00 to 5.50
No. 1 low phos. heavy	14.50 to 15.00
Couplers and knuckles	14.00 to 14.50
Rolled steel wheels	14.00 to 14.50
Steel axles	16.00
Shafting	17.50 to 18.00
No. 1 railroad wrought	12.00 to 12.50
Spec. iron and steel pipe	9.50 to 10.00
Bundled sheets	9.50 to 10.00
No. 1 forge fire	9.50 to 10.00
Cast borings (chem.)	10.50 to 13.00

CINCINNATI

Dealers' buying prices per gross ton:

No. 1 heavy melting steel	$9.00 to $9.50
No. 2 heavy melting steel	7.50 to 8.00
Scrap rails for melting	8.75 to 9.25
Loose sheet clippings	5.50 to 6.00
Bundled sheets	6.75 to 7.25
Cast iron borings	5.00 to 5.50
Machine shop turnings	5.25 to 5.75
No. 1 busheling	6.75 to 7.25
No. 2 busheling	3.25 to 3.75
Rails for rolling	9.75 to 10.25
No. 1 locomotive tires	8.00 to 8.50
Short rails	12.50 to 13.00
Cast iron carwheels	9.00 to 9.50
No. 1 machinery cast	10.00 to 10.50
No. 1 railroad cast	9.25 to 9.75
Burnt cast	6.75 to 7.25
Stove plate	6.75 to 7.25
Agricultural malleable	8.75 to 9.25
Railroad malleable	10.00 to 10.50

CLEVELAND

Per gross ton delivered consumers' yards:

No. 1 heavy melting steel	$12.25 to $12.50
No. 2 heavy melting steel	11.25 to 11.50
Compressed sheet steel	11.00 to 11.50
Light bundled sheet stampings	9.25 to 9.75
Drop forge flashings	10.50 to 11.00
Machine shop turnings	7.75 to 8.25
Short shoveling turnings	8.00 to 8.50
No. 1 busheling	10.50 to 11.00
Steel axle turnings	10.50 to 11.00
Low phos. billet crops	15.00 to 15.50
Cast iron borings	7.75 to 8.25
Mixed borings and short turnings	7.75 to 8.25
No. 2 busheling	7.75 to 8.25
No. 1 cast	12.50 to 13.00
Railroad grate bars	7.00 to 7.50
Stove plate	7.50 to 8.00
Rails under 3 ft.	13.00 to 13.50
Rails for rolling	15.50 to 16.00
Railroad malleable	14.50 to 15.00
Cast iron carwheels	10.75 to 11.00

BUFFALO

Per gross ton, f.o.b. Buffalo consumers' plants:

No. 1 heavy melting steel	$12.00 to $12.50
No. 2 heavy melting scrap	10.50 to 11.00
Scrap rails	12.00 to 12.50
New hydraul. comp. sheets	10.50 to 11.00
Old hydraul. comp. sheets	9.50 to 10.00
Drop forge flashings	10.50 to 11.00
No. 1 busheling	10.50 to 11.00
Hvy. steel axle turnings	10.50 to 11.00
Machine shop turnings	5.50 to 6.00
Knuckles and couplers	13.00 to 14.00
Coil and leaf springs	13.00 to 14.00
Rolled steel wheels	13.00 to 14.00
Low phos. billet crops	14.50 to 15.00
Short shov. steel turnings	7.50 to 8.00
Short mixed borings and turnings	7.50 to 8.00
Cast iron borings	7.50 to 8.00
No. 2 busheling	7.00 to 7.50
Steel car axles	12.50 to 13.00
Iron axles	12.50 to 13.00
No. 1 machinery cast	12.00 to 12.50
No. 1 cupola cast	11.50 to 12.00
Stove plate	10.00 to 10.50
Steel rails, 3 ft. and under	14.25 to 14.75
Cast iron carwheels	12.00 to 12.50
Railroad malleable	13.50 to 14.00
Chemical borings	9.00 to 9.50

BOSTON

Dealers' buying prices per gross ton:

*No. 1 heavy melting steel	$9.50 to $9.75
No. 1 heavy melting steel	7.00 to 7.40
Scrap rails	7.00 to 7.50
*No. 2 steel	8.50 to 8.75
No. 2 steel	6.00 to 6.40
Breakable cast	6.00 to 6.25
Machine shop turnings	3.65
*Machine shop turnings	4.50 to 5.00
Bundled skeleton, long	6.00 to 6.15
Forge flashings	6.00 to 6.40
Shafting	12.00 to 12.50
Steel car axles	12.00 to 12.25
Cast iron borings, chemical	5.00 to 7.00

Per gross ton delivered consumers' yards:

Textile cast	$9.50 to $10.00
No. 1 machinery cast	9.50 to 10.00
Stove plate	6.00 to 6.50
Railroad malleable	11.00 to 11.50

* Delivered local army base.

NEW YORK

Dealers' buying prices per gross ton:

No. 1 heavy melting steel	$8.50 to $8.75*
No. 2 heavy melting steel	7.50 to 7.75*
Heavy breakable cast	6.75 to 7.25
No. 1 machinery cast	7.00 to 7.50
No. 2 cast	†6.50
Stove plate	†6.50
Steel car axles	13.50 to 14.00
Shafting	13.50 to 13.75
No. 1 railroad wrought	7.75 to 8.25
No. 1 yard wrought, long	6.75 to 7.25
Spec. iron and steel pipe	5.50 to 6.00
Forge fire	6.50 to 7.00
Rails for rolling	9.00 to 10.00
Short shoveling turnings	3.00 to 3.25
Machine shop turnings	3.50 to 4.00
Cast borings	3.50 to 3.75
No. 1 blast furnace	2.00 to 2.50
Cast borings (chemical)	11.00 to 11.50
Unprepared yard iron and steel	4.50 to 5.00

Per gross ton, delivered local foundries:

No. 1 machinery cast	$10.50
No. 1 hvy. cast (cupola size)	9.50
No. 2 cast	8.00

† Loading on barge.
*25c. higher offered at nearby New Jersey points.

BIRMINGHAM

Per gross ton delivered consumers' yards:

Heavy melting steel	$7.50 to $8.00
Scrap steel rails	10.00 to 10.50
Short shoveling turnings	7.00
Stove plates	7.00
Steel axles	11.50
Iron axles	11.50
No. 1 railroad wrought	7.00
Rails for rolling	12.50
No. 1 cast	10.00 to 10.50
Tramcar wheels	10.00

ST. LOUIS

Per gross ton delivered consumers' yards:

Selected heavy steel	$9.25 to $9.75
No. 1 heavy melting	8.75 to 9.25
No. 2 heavy melting	7.75 to 8.25
No. 1 locomotive tires	9.75 to 10.25
Misc. stand-sec. rails	11.00 to 11.50
Railroad springs	12.00 to 12.50
Bundled sheets	6.00 to 6.50
No. 2 railroad wrought	9.25 to 9.75
No. 1 busheling	5.00 to 5.50
Cast iron borings and shoveling turnings	3.00 to 3.50
Rails for rolling	11.50 to 12.00
Machine shop turnings	3.75 to 3.25
Heavy turnings	5.50 to 6.00
Steel car axles	12.50 to 13.00
Iron car axles	15.00 to 16.00
No. 1 railroad wrought	7.00 to 7.50
Steel rails less than 3 ft.	12.00 to 12.50
Steel angle bars	12.00 to 12.50
Cast iron carwheels	9.00 to 9.50
No. 1 machinery cast	9.50 to 10.00
Railroad malleable	12.50 to 13.00
No. 1 railroad cast	9.00 to 9.50
Stove plate	6.50 to 7.00
Agricult. malleable	8.50 to 9.00

DETROIT

Dealers' buying prices per gross ton:

Heavy melting steel	$9.50 to $10.00
Borings and short turnings	5.50 to 6.00
Long turnings	$5.25 to $5.75
No. 1 machinery cast	12.00 to 13.50
Automotive cast	12.50 to 13.00
Hydraul. comp. sheets	10.00 to 10.50
Stove plate	7.50 to 8.00
New factory busheling	8.50 to 9.00
Old No. 2 busheling	5.00 to 5.50
Sheet clippings	6.50 to 7.00
Flashings	8.00 to 8.50
Low phos. plate scrap	10.00 to 10.50

CANADA

Dealers' buying prices per gross ton:

	Toronto	Montreal
Heavy melting steel	$7.00	$7.00
Rails scrap	8.00	8.00
Machine shop turnings	3.00	3.00
Boiler plate	4.50	4.50
Heavy axle turnings	4.50	4.00
Cast borings	4.00	3.50
Steel borings	2.00	2.00
Wrought pipe	3.50	3.50
Steel axles	7.00	8.00
Axles, wrought iron	7.00	8.00
No. 1 machinery cast	9.00	9.00
Stove plate	5.50	5.00
Standard carwheels	7.25	7.00
Malleable	6.75	7.00

ORES, FLUORSPAR, COKE, FUEL, REFRACTORIES

Lake Superior Ores

Delivered Lower Lake Ports

	Per Gross Ton
Old range, Bessemer, 51.50% iron	$4.80
Old range, non-Bessemer, 51.50% iron	4.65
Mesabi, Bessemer, 51.50% iron	4.65
Mesabi, non-Bessemer, 51.50% iron	4.50
High phosphorus, 51.50% iron	4.40

Foreign Ore

C.i.f. Philadelphia or Baltimore

	Per Unit
Iron, low phos., copper free, 55 to 58% iron, dry Spanish or Algeria	10.50c.
Iron, low phos., Swedish, average 68½% iron	10.50c.
Iron, basic or foundry, Swedish, aver. 65% iron	9.50c.
Iron, basic or foundry, Russian, aver. 65% iron	9.50c.
Manganese, Caucasian, washed 52%	26c.
Manganese, African, Indian, 44-48%	22c.
Manganese, African, Indian, 49-51%	24c.
Manganese, Brazilian, 46 to 48½%	20c.

	Per Net Ton Unit
Tungsten, Chinese, wolframite, duty paid, delivered	$15.50 to $16.00
Tungsten, domestic, scheelite, delivered	15.00

	Per Gross Ton
Chrome, 45% Cr_2O_3, lump, c.i.f. Atlantic Seaboard (African)	$17.50
45 to 46% Cr_2O_3 (Turkish)	$16.00 to 16.50
48% Cr_2O_3 (African)	20.50
48% min. Cr_2O_3 (Turkish)	19.25
Chrome concentrate, 50% and over Cr_2O_3, c.i.f. Atlantic Seaboard	22.00
52% Cr_2O_3 (Turkish)	21.75
48 to 48% Cr_2O_3 (Turkish)	19.25

Fluorspar

	Per Net Ton
Domestic, washed gravel, 85-5, f.o.b. Kentucky and Illinois mines for all-rail shipment	$14.00 to $15.00
Same grade for Ohio River barge shipment for Kentucky and Illinois River landings	14.00 to 15.00
No. 2 lump, 85-5, f.o.b. Kentucky and Illinois mines	14.00 to 15.00
Foreign, 35% calcium fluoride, not over 5% silicon, c.i.f. Atlantic ports, duty paid	18.50
Domestic, No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2½% silicon, f.o.b. Illinois and Kentucky mines	20.00

COKE, COAL AND FUEL OIL

Coke

	Per Net Ton
Furnace, f.o.b. Connellsville Prompt	$3.25 to $3.50
Foundry, f.o.b. Connellsville Prompt	4.00 to 5.10
Foundry, by-product, Chicago ovens, for delivery outside switching district	8.50
Foundry, by-product, delivered in Chicago switching district	9.25
Foundry, by-product, New England, delivered	11.00
Foundry, by-product, Newark or Jersey City, del'd	9.24 to 9.72
Foundry, by-product, Phila.	9.02
Foundry, by-product, Cleveland, delivered	9.25
Foundry, Birmingham	6.00
Foundry, by-product, St. Louis, f.o.b. ovens	8.00
Foundry, by-product, del'd St. Louis	9.00
Foundry, from Birmingham, f.o.b. cars docks, Pacific ports	14.75

Coal

	Per Net Ton
Mine run steam coal, f.o.b. W. Pa. mines	$1.45 to $1.65
Mine run coking coal, f.o.b. W. Pa.	1.75 to 1.95
Gas coal, ¾-in., f.o.b. Pa. mines	1.85 to 2.35
Mine run gas coal, f.o.b. Pa. mines	1.75 to 1.95
Steam slack, f.o.b. W. Pa. mines	1.00 to 1.25
Gas slack, f.o.b. W. Pa. mines	1.20 to 1.45

Fuel Oil

	Per Gal. f.o.b. Bayonne, N. J.
No. 3 distillate	4.25c.
No. 4 industrial	3.87½c.

	Per Gal. f.o.b. Baltimore
No. 3 distillate	4.25c.
No. 4 industrial	3.87½c.

	Per Gal. del'd Chicago
No. 3 industrial fuel oil	4.75c.
No. 5 industrial fuel oil	3.75c.

	Per Gal. f.o.b. Cleveland
No. 3 distillate	5.25c.
No. 4 industrial	5.12½c.
No. 5 industrial	4.25c.

REFRACTORIES

Fire Clay Brick

	Per 1000 f.o.b. Works High-heat Duty Brick	Intermediate Duty Brick
Pennsylvania	$45.00	$40.00
Maryland	5.00	40.00
New Jersey	50.00	42.00
Ohio	45.00	40.00
Kentucky	45.00	40.00
Missouri	45.00	40.00
Illinois	45.00	40.00
Ground fire clay, per ton	7.00	

Silica Brick

	Per 1000 f.o.b. Works
Pennsylvania	$45.00
Chicago District	54.00
Birmingham	55.00
Silica clay, per net ton	8.00

Chrome Brick

	Per Net Ton
Standard, f.o.b. Baltimore, Plymouth Meeting and Chester, Pa.	$45.00
Chemically bonded, f.o.b. Baltimore, Plymouth Meeting and Chester, Pa.	45.00

Magnesite Brick

	Per Net Ton
Standard, f.o.b. Baltimore and Chester, Pa.	$65.00
Chemically Bonded, f.o.b. Baltimore	55.00

Grain Magnesite

	Per Net Ton
Imported f.o.b. Baltimore and Chester, Pa.	$45.00
Domestic, f.o.b. Baltimore and Chester	46.00
Domestic, f.o.b. Chewelah, Wash.	32.00

Warehouse Prices for Steel Products

PITTSBURGH

Base per Lb.

Plates	3.15c.
Structural shapes	3.15c.
Soft steel bars and small shapes	2.90c.
Reinforcing steel bars	2.90c.
Cold-finished and screw stock:	
Rounds and hexagons	3.20c.
Squares and flats	3.20c.
Hoops and bands under ¼ in.	3.20c.
Hot-rolled annealed sheets (No. 24), 25 or more bundles	3.30c.
Galv. sheets (No. 24), 25 or more bundles	3.95c.
Hot-rolled sheets (No. 10)	2.95c.
Galv. corrug. sheets (No. 28), per square (more than 3750 lb.)	$3.69
Spikes, large	2.90c.
Track bolts, all sizes, per 100 count, 65 per cent off list.	
Machine bolts, 100 count, 65 per cent off list.	
Carriage bolts, 100 count, 65 per cent off list.	
Nuts, all styles, 100 count, 65 per cent off list.	
Large rivets, base per 100 lb.	$3.50
Wire, black, soft ann'l'd, base per 100 lb	*2.70
Wire, galv, soft, base per 100 lb.	*2.925
Common wire nails, per keg	*2.834
Cement coated nails, per keg	*2.834

On plates, structurals, bars, reinforcing bars, bands, hoops and blue annealed sheets, base applies to orders of 400 to 9999 lbs.

*Delivered in Pittsburgh switching district.

CHICAGO

Base per Lb.

Plates and structural shapes	3.20c.
Soft steel bars	2.95c.
Cold-fin. steel bars:	
Rounds and hexagons	3.35c.
Flats and squares	3.35c.
Hot-rolled strip	3.30c.
Hot-rolled annealed sheets (No. 24)	3.85c.
Galv. sheets (No. 24)	4.55c.
Hot-rolled sheets (No. 10)	3.05c.
Spikes (keg lots)	3.50c.
Track bolts (keg lots)	4.65c.
Rivets, structural (keg lots)	3.65c.
Rivets, boiler (keg lots)	3.75c.
	Per Cent Off List
Machine bolts	*70
Carriage bolts	*70
Lag screws	*70
Hot-pressed nuts, sq. tap. or	
Hot-pressed nuts, sq. tap or blank	*70
Hot-pressed nuts, hex. tap or	
Hot-pressed nuts, hex. tap or blank	*70
Hex. head cap screws	87½
Cut point set screws	80
Flat head bright wood screws	.50 and 20
Spring cotters	55
Stove bolts in full packages	70
Bd. hd. tank rivets, 7/16 in. and smaller	.57½
Wrought washers	$4.50 off list
Black ann'l'd wire per 100 lb.	$3.85
Cem. wire nails, base per keg	2.95†
Cement c't'd nails, base per keg	2.95†

On plates, shapes, bars, hot-rolled strip and heavy hot-rolled sheets, the base applies on orders of 400 to 9999 lb. All prices are f.o.b. consumers' plants within the Chicago switching district.

*These are quotations delivered to city trade for quantities of 100 lb. or more. For lots of less than 100 lb., the quotation is 65 per cent off. Discounts applying to country trade are 70 per cent off, f.o.b. Chicago, with full or partial freight allowed up to 50c. per 100 lb.

†Prices for city and suburbs only.

NEW YORK

Base per Lb.

Plates, ¼ in. and heavier	3.40c.
Structural shapes	3.37c.
Soft steel bars, small shapes	3.36c.
Iron bars	3.36c.
Iron bars, swed. charcoal	6.75c. to 7.00c.
Cold-fin. shafting and screw stock:	
Rounds and hexagons	3.81c.
Flats and squares	4.31c.
Cold-rolled: strip, soft and quarter hard	3.36c.
Hoops	3.56c.
Bands	3.56c.
Hot-rolled sheets (No. 10)	3.31c.
Hot-rolled ann'l'd sheets (No. 24*)	3.89c.
Galvanized sheets (No. 24*)	4.50c.
Long terne sheets (No. 24)	5.20c.
Standard tool steel	11.00c.
Wire, black annealed (No. 10)	3.40c.
Wire, galv. (No. 10)	3.75c.
Tire steel, 1 x ½ in. and larger	3.65c.
Open hearth spring steel	4.00c. to 10.00c.
Common wire nails, base, per keg	$3.21
	Per Cent
Machine bolts, cut thread:	Off List
All diameters	65 and 10
Carriage bolts, cut thread:	
All diameters	65 and 10
Boiler tubes:	Per 100 Ft.
Lap welded, 2-in.	$18.05
Seamless welded, 2-in.	19.24
Charcoal iron, 2-in.	24.94
Charcoal iron 4-in.	63.65

*No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.

ST. LOUIS

Base per Lb.

Plates and struc. shapes	3.45c.
Bars, soft steel or iron	3.20c.
Cold-fin. rounds, shafting, screw stocks	3.60c.
Hot-rolled annealed sheets (No. 24)	4.10c.
Galv. sheets (No. 24)	4.65c.
Hot-rolled sheets (No. 10)	3.30c.
Black corrug. sheets (No. 24)	4.10c.
*Galv. corrug. sheets	4.65c.
Structural rivets	4.00c.
Boiler rivets	4.10c.
	Per Cent Off List
Tank rivets, 7/16 in. and smaller	55
Machine and carriage bolts, lag screws, fitting up bolts, bolt ends, plow bolts, hot-pressed nuts, square and hexagon, tapped or blank, semi-finished nuts: All quantities	70

*No. 26 and lighter take special prices.

PHILADELPHIA

Base per Lb.

*Plates, ¼-in. and heavier	2.98c.
*Structural shapes	2.98c.
*Soft steel bars, small shapes, iron bars (except bands)	2.93c.
‡Reinforc. steel bars, sq. twisted and deformed	2.96c.
Cold-finished steel bars	3.61c.
*Steel hoops	3.43c.
*Steel bands, No. 12 and 3/16 in. incl.	3.18c.
Spring steel	5.00c.
†Hot-rolled aneal. sheets (No. 24)	3.65c.
†Galvanized sheets (No. 24)	4.30c.
*Hot-rolled annealed sheets (No. 10)	3.08c.
Diam. pat. floor plates, ¼ in.	4.95c.
Swedish iron bars	6.25c.

These prices are subject to quantity differentials except on reinforcing and Swedish iron bars.

*Base prices subject to deduction on orders aggregating 4000 lb. or over.

†For 50 bundles or over.

‡For less than 2000 lb.

CLEVELAND

Base per Lb.

Plates and struc. shapes	3.31c.
Soft steel bars	2.95c.
Reinfore. steel bars	2.10c.
Cold-finished steel bars	3.25c.
Flat-rolled steel under ¼ in.	3.36c.
Cold-finished strip	13.00c.
Hot-rolled annealed sheets (No. 24)	3.96c.
Galvanized sheets (No. 24)	4.61c.
Hot-rolled sheets (No. 10)	3.11c.
Hot-rolled 3/16 in. 24 to 48 in. wide sheets	3.56c.
*Black ann'l'd wire, per 100 lb.	$2.75
*No. 9 galv. wire, per 100 lb.	3.10
*Com. wire nails, base per keg	2.70

†Outside delivery 10c. less.

*For 5000 lb. or less.

CINCINNATI

Base per Lb.

Plates and struc. shapes	3.42c.
Bars, soft steel or iron	3.17c.
New billet reinfore. bars	3.25c.
Rail steel reinfore. bars	3.25c.
Hoops and bands, 3/16 in. and lighter	3.47c.
Cold-finished bars	3.57c.
Hot-rolled annealed sheets (No. 24)	4.02c.
Galv. sheets (No. 24)	4.72c.
Hot-rolled sheets (No. 10)	3.22c.
Structural rivets	4.35c.
Small rivets	55 per cent off list
No. 9 ann'l'd wire, per 100 lb. (1000 lb. or over)	$2.88
Com. wire nails, base per keg:	
Any quantity less than carload	3.04
Cement c't'd nails, base 100-lb. keg.	3.50
Chain, 1in. per 100 lb.	8.35
	Net per 100 Ft.
Seamless steel boiler tubes, 2-in.	$22.66
4-in.	48.14
Lap-welded steel boiler tubes, 2-in.	19.35
4-in.	45.30

BUFFALO

Base per Lb.

Plates	3.38c.
Struc. shapes	3.25c.
Soft steel bars	3.00c.
Reinforcing bars	2.60c.
Cold-fin. flats and sq.	3.40c.
Round and hex.	3.40c.
Cold-rolled strip steel	3.19c.
Hot-rolled annealed sheets (No. 24)	4.06c.
Heavy hot-rolled sheets (3/16 in., 24 to 48 in. wide)	3.63c.
Galv. sheets (No. 24)	4.70c.
Bands	3.43c.
Hoops	3.43c.
Heavy hot-rolled sheets	3.18c.
Com. wire nails, base per keg	$3.35
Black wire, base per 100 lb. (2500-lb. lots or under)	3.55
(Over 2500 lb.)	3.45

BOSTON

Base per Lb.

Beams, channels, angles, tees, zees	3.54c.
H beams and shapes	3.54c.
Plates—Sheered, tank and univ. mill, ¼ in. thick and heavier	3.56c.
Floor plates, diamond pattern	5.36c.
Bar and bar shapes (mild steel)	3.35c.
Bands 3/16 in. thick and No. 12 ga. incl.	3.65c. to 4.65c.
Half rounds, half ovals, ovals and bevels	4.60c.
Tire steel	4.60c.
Cold-rolled strip steel	3.245c.
Cold-finished rounds, squares and hexagons	3.90c.
Cold-finished flats	3.75c.
Blue annealed sheets, No. 10 ga.	3.65c.
One pass cold-rolled sheets No. 24 ga.	4.20c.
Galvanized steel sheets, No. 24 ga.	4.90c.
Lead coated sheets, No. 24 ga.	5.85c.

Prices delivered by truck in metropolitan Boston, subject to quantity differentials.

DETROIT

Base per Lb.

Soft and bars	3.04c.
Structural shapes	3.42c.
Plates	3.42c.
Floor plates	5.17c.
Hot-rolled annealed sheets (No. 24)	3.94c.
Hot-rolled sheets (No. 10)	3.14c.
Galvanized sheets (No. 24)	4.72c.
Bands	3.39c.
Hoops	3.39c.
Cold-finished bars	3.49c.
Cold-rolled strip	3.18c.
Hot-rolled alloy steel (S.A.E. 3100 Series)	5.29c.*
Bolts and nuts	.70 and 5 per cent off list

Prices delivered by truck in metropolitan Detroit, subject to quantity differentials.

*Price applies to 1,000 lb. and over.

MILWAUKEE

Base per Lb.

Plates and structural shapes	3.31c.
Soft steel bars	3.06c.
Hot-rolled strip	3.41c.
Hot-rolled sheets (No. 10)	3.16c.
Hot-rolled annealed sheets (No. 24)	3.96c.
Galvanized sheets (No. 20)	4.66c.
Cold-finished steel bars	3.46c.
Cold-rolled strip	3.33c.
Structural rivets (keg lots)	3.86c.
Boiler rivets, cone head (keg lots)	3.96c.
Boiler rivets, rd. head (keg lots)	3.86c.
Track spikes (keg lots)	3.71c.
Track bolts (keg lots)	4.86c.
*Black annealed wire	3.25c.
†Com. wire nails	2.95c.
Cement coated nails	2.90c.
	Per Cent Off List
Machine bolts	.70 and 10
Carriage bolts	.70 and 10
Hot-pressed nuts, sq. and hex. tapped or blank (keg lots)	.70 and 10

Prices given above are delivered Milwaukee.

On plates, shapes, bars, hot-rolled strip and heavy hot-rolled sheets, the base applies on orders of 400 to 9999 lb. On galvanized and No. 24 hot-rolled annealed sheets the prices given apply on orders of 400 to 1500 lb. On cold-finished bars the prices are for orders of 1000 lb. or more of a size.

*For quantities of 500 to 2500 lb. assorted black annealed and galvanized wire.

†For orders of 50 kegs or less.

ST. PAUL

Base per Lb.

Mild steel bars	3.20c.
Structural shapes	3.45c.
Plates	3.45c.
Cold-finished bars	3.87c.
Bands and hoops	3.55c.
Hot-rolled annealed sheets, No. 24	3.90c.
Galvanized sheets, No. 24	4.50c.
Cold-rolled sheets, No. 20	4.95c.

On mild steel bars, shapes, plates and hoops and bands the base applies on 400 to 14,999 lb. On cold-finished bars, hot-rolled sheets, galvanized sheets and cold-rolled sheets base applies on 15,000 lb. and over.

BALTIMORE

Base per Lb.

*Mild steel bars	2.95c.
*Iron bars	2.95c.
*Reinforcing bars	2.95c.
*Structural shapes	3.00c.
†Plates	3.00c.
†Hot-rolled sheets, No. 10	3.10c.
‡Hot-rolled annealed sheets, No. 24	3.60c.
‡Galvanized sheets, No. 24	4.30c.
*Bands	3.20c.
*Hoops	3.45c.
§Cold-rolled rounds	3.58c.
§Cold-rolled squares, hex. and flats	3.58c.
Rivets	4.40c.
Bolts and nuts, per cent off list	.60 and 10

*Quantity extras per size apply. †Quantity extras per thickness apply. Hot-rolled quantity extras are: 2000 lb. and over, base; 1500 lb. to 1999 lb. add 15c. per 100 lb.; 1000 lb. to 1499 lb., add 30c.; 0 to 999 lb., add 50c.

‡50 bundles and over, base. For 1 to 9 bundles add 50c. per 100 lb.; for 10 to 49 bundles add 25c.

§Base for 1000 lb. and over. For 500 to 999 lb. add 25c. per 100 lb.; for 300 to 499 lb. add 75c.; for 0 to 299 lb. add $1.25.

CHATTANOOGA

Base per Lb.

Mild steel bars	3.31c.
Iron bars	3.31c.
Reinforcing bars	3.31c.
Structural shapes	3.56c.
Plates	3.56c.
Hot-rolled sheets, No. 10	3.36c.
Hot-rolled annealed sheets, No. 24	4.21c.
Galvanized sheets, No. 24	4.86c.
Steel bands	3.61c.
Cold-finished bars	3.98c.

MEMPHIS

Base per Lb

Mild steel bars	3.42c.
Shapes, bar size	3.42c.
Iron bars	3.42c.
Structural shapes	3.67c.
Plates	3.67c.
Hot-rolled sheets, No. 10	3.47c.
Hot-rolled annealed sheets, No. 24	4.27c.
Galvanized sheets, No. 24	4.97c.
Steel bands	3.72c.
Cold-drawn rounds	3.89c.
Cold-drawn flats, squares, hexagons	5.89c.
Structural rivets	4.25c.
Bolts and nuts, per cent off list	65
Small rivets, per cent off list	50

NEW ORLEANS

Base per Lb.

Mild steel bars	3.30c.
Reinforcing bars	3.50c.
Structural shapes	3.55c.
Plates	3.55c.
Hot-rolled sheets, No. 10	3.55c.
Hot-rolled annealed sheets, No. 24	4.50c.
Galvanized sheets, No. 24	4.95c.
Steel bands	3.95c
Cold-finished steel bars	4.15c.
Structural rivets	4.25c.
Boiler rivets	4.25c.
Common wire nails, base per keg	$3.10
Bolts and nuts, per cent off list	70

PACIFIC COAST

Base per Lb.

	San Francisco	Los Angeles	Seattle
Plates, tank and U. M.	3.55c.	3.60c.	3.55c.
Shapes, standard	3.55c.	3.60c.	3.55c.
Soft steel bars	3.60c.	3.60c.	3.60c.
Reinforcing bars, f.o.b. cars dock Pacific ports	2.45c.	2.45c.	2.45c.
Hot-rolled annealed sheets (No. 24)	4.40c.	4.35c.	4.40c.
Hot-rolled sheets (No. 10)	3.75c.	3.70c.	3.75c.
Galv. sheets (No. 24)	5.00c.	4.95c.	5.00c.
Cold finished steel Rounds	5.95c.	5.85c.	6.00c.
Squares and hexagons	7.20c.	7.10c.	7.25c.
Flats	7.70c.	7.60c.	8.25c.
Common wire nails —base per keg	$3.30	$3.40	$3.30

All items subject to differentials for quantity.

TOOL STEEL

Prices are same for warehouse distribution at all points on or East of Mississippi River. West of Mississippi quotations are 1c. a lb. higher.

Base per Lb.

High speed	57c.
High carbon chrome	37c.
Oil hardening	22c.
Extra	17c.
Regular	14c.

Demand Improves Moderately In New York Area

Business Is Widely Distributed and Little of It Is Anticipatory—Labor Restriction on Public Projects Is Eliminated

NEW YORK, Sept. 17.—Aggregate demand for finished steel is being maintained and in some cases is increasing, notwithstanding the falling off in tin plate orders. Business in galvanized sheets has improved materially, reflecting anticipatory purchases by jobbers, who will lose their $2 a ton discount on Oct. 1. However, it is difficult to put one's finger on the primary cause for business betterment. Orders are widely distributed among a great variety of consumers, most of which are taking steel in moderately increased volume. Aside from purchases of galvanized sheets by jobbers there are few orders that can be classed as anticipatory. Makers of steel drums are buying sheets in larger volume because of the rising seasonal demand for alcohol containers. Manufacturers of molding are taking larger quantities of cold-rolled strip, presumably because of the sustained, though gradual, gain in private building construction.

New Navy boats to be constructed in this immediate district include a light cruiser, requiring 7000 tons of steel, to be built in the local Navy yard, and three destroyers, calling for about 2000 tons, to be fabricated at the Federal Shipbuilding & Dry Dock Co., Kearny, N. J. A light cruiser on which tenders were rejected by the Government will come up for revised bids Oct. 2.

The Board of Transportation, New York, will take figures Oct. 4 on the first section of the Sixth Avenue subway, Manhattan, from Fortieth to Forty-seventh Streets, requiring 3300 tons of structural steel and 250 tons of reinforcing bars.

The New York Central, which last week closed for 7400 tons of rails, is understood to have placed supplementary orders for fastenings, including 1500 tons of tie plates and 200 tons of spikes.

The Presidential restriction on public work, limiting Federal allocations to $1,400 per worker per year, has been removed. Regulations carrying this change have been issued by the Chief of the Bureau of Public Roads, and it is assumed that pending highway and grade crossing work will now go ahead without further impediment. Water front improvements at Bayonne, N. J., Deal, N. J., Long Beach, N. Y., and New York have been approved by the PWA. At least some of these projects will call for sheet steel piling. An initial Federal allotment of $5,000,000 has been approved for a ship canal across the State of Florida and work will start immediately. Considerable sheet steel piling will be required.

Pig Iron

A Massachusetts textile machinery maker has distributed 10,000 tons of fourth quarter foundry iron among eight different sellers located in this and adjacent areas. No foreign iron figured in the purchase. A moderate portion of a number of smaller inquiries, aggregating 7000 to 8000 tons, has also been placed. The local market, though relatively quiet, continues to have an undertone of strength, and the outlook with which sellers view the remaining part of the year is, if anything, even brighter. Orders taken last week in this immediate area totaled about 2000 tons for general fourth quarter delivery. This compares with 4200 tons sold in the preceding week and 1750 tons booked a fortnight ago.

Reinforcing Steel

Billet and rail-steel bars are quoted at 2.50c. and 2.35c. respectively for carloads, delivered by truck to a job. However, several recent orders which have involved little or no bending extras have developed sizable reductions from published price levels. This weakness, however, has not become general enough to establish the market publicly at the lower levels. The largest award in this area for some time was made last week as Igoe Brothers secured the contract for 2100 tons of bars for the Queens connection of the Triborough Bridge. American Steel & Wire Co. will furnish 925 tons of mesh for Warren, Orange and Columbia counties, N. Y., highways, and Carroll-McCreary & Co., Inc., will ship over 700 tons of bars to Panama. Concrete Steel Co. will furnish 130 tons for the Atlantic City, N. J., post office, and an early award of 350 tons for a Tarrytown, N. Y., building is expected from the Barney Ahlers Co., which is the general contractor.

Scrap

Most brokers are reluctant to sell and the average consumer is generally unwilling to buy a sizable quantity at present price levels. Inasmuch as the Japanese are not badly in need of scrap, they show no indication of meeting broker demands for new business. Only a sharp rise in Pittsburgh quotations would bring Japanese bids more in line with broker demands. England, likewise, is not willing to meet current prices, and business with this country is confined mostly to deliveries against old orders. Italy is in the market, and moderate sales have been made during the week on a cash basis. Deliveries to this country are of major importance in this area at the present time. Dealers are delivering tonnages to brokers' barges at prices unchanged from a week ago, but the flow of material is none too plentiful as the average dealer sentiment continues to be somewhat bullish. Rail deliveries of No. 1 and No. 2 from nearby Jersey points into eastern Pennsylvania continue in moderately heavy volume.

Demand Sustained At Cincinnati

CINCINNATI, Sept. 17.—Sales of foundry scrap at better prices have tended to strengthen the tone of the district old material market. Mill ordering is nil, but dealers continue to anticipate heavy ordering from steel sources and are bidding the market up on all grades. Material in yards is in substantial volume, placing dealers in a good position to meet the expected heavy demands for fall operations.

Expansion of automotive demand has pegged sheet demand at near to 70 per cent of mill capacity. Miscellaneous orders are holding up and pressure for delivery on full-finished specifications

is unabated. Bookings, while chiefly for current needs, are being extended in some cases to cover needs to Nov. 1. The regularity of demand has forced a stepping up of rolling schedules to equal orders and backlogs have virtually disappeared.

Analysis of fourth quarter pig iron ordering reveals slightly heavier forward covering. This reflects either a desire for protection against possible price increases or a move to build better inventories against the heavier melt. Shipments are good, consumers ordering material at the contract rate. Foundry operations in all lines, except machine tools, are sustained, and the trade feels the only change likely is upward. Machine tool melters are feeling a reaction during the show, but are looking forward to heavy ordering the latter part of this month.

Foundry coke specifications are at the high rate established the past fortnight, and domestic coke is reacting to the stimulus of cool weather.

Steel Demand Improves in South

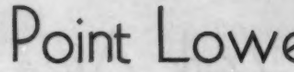
BIRMINGHAM, Sept. 17.—Steel bookings continue favorable and on a par with those of the past several weeks. The market is more active than it has been in a long while, and demand is general with the exception of railroad products. While individual orders for sheets and wire products are in many cases limited, the aggregate tonnage has now reached sizable proportions. Orders for structural steel and plates are more numerous.

The Tennessee Coal, Iron & Railroad Co. is operating seven out of nine open-hearths at Fairfield, and Gulf States Steel Co., four out of six at Alabama City, a total of 11 out of the 24 in the district.

Four Alabama companies and one Tennessee company shared in the bar tonnage awarded by the Metropolitan Water District of Southern California. Gulf States Steel Co., Tennessee Coal, Iron & Railroad Co., Connors Steel Co., Kilby Car & Foundry Co. and Knoxville Iron Co. secured a total of 12,000 tons.

Pig iron demand shows moderate improvement this month. The market is still largely on a spot basis, with orders mostly in small lots. There is a gradual accumulation of fourth quarter tonnage, also in small lots. Six blast furnaces are operating, no change having occurred since Aug. 20.

Philadelphia Operations One Point Lower at 38 Per Cent



Price Weakness Develops on Some Forms of Steel—Sales Volume Unchanged—Scrap Retains Firm Undertone

PHILADELPHIA, Sept. 17.—A feature of the current steel market is the growing weakness which is developing in reinforcing bars. This tendency is not confined to Philadelphia and environs, but is noticeable throughout the East. Despite occasional deviations, however, most of the larger sellers of billet bars continue to maintain a 2.05c., Pittsburgh, base price.

The larger sellers are also quietly accusing some smaller eastern mills of selling cold-rolled sheets in this territory at the same price that the same grades are delivered to Detroit users. Such action would constitute a reduction of 11c. per 100 lb.

Operations of smaller mills here are practically unchanged from last week but the major interest has reduced operations to such an extent as to force the district rate down one point to 38 per cent of capacity, as compared with activity of 16 per cent this time last year. This reduction appears to be only temporary and, in addition, several of the smaller plants nearby anticipate slight increases in melting activity the first of October. Thus the district rate will probably be maintained at its present level and may advance slightly over the next two months.

Steel sales here are only slightly better than for the same period last month. Jobbers are buying more heavily but are still confining orders to small lots. After a long period of dullness, steel pipe has recently shown signs of becoming more active.

Pig Iron

The recent improvements noted in foundry activity have been generally maintained, and a generally better outlook for the industry is influencing melters to order iron more freely. Although bookings are still mostly for small lots, they are nevertheless considerably more frequent and specify delivery dates farther ahead than has been the practice during the past few quarters. All sellers are holding steadily to quoted price levels, and there is little likelihood of these quotations being advanced in the near future, despite advances in prices on furnace raw materials and labor.

Sheets and Strip

Jobbers continue to purchase galvanized sheets in fair amounts and local fabricators are constantly in the market for small lots of full-finished and blue-annealed. Tin plate sales to novelty can makers have improved to some extent, and stainless is moving in better volume. The activity at the Budd plant is somewhat typical of the entire district. This company reports a 45 per cent increase in purchases of ordinary steel for auto parts and an increase of 33 per cent in stainless steel purchases for light-weight trains, as compared with purchases for the same period last year. When auto production swings into full schedule, these purchases will show even a further improvement.

Bars, Plates and Shapes

The Camden, N. J., storage warehouse and water tank, involving 900 tons of shapes, has been awarded to Belmont Iron Works at a bid price of $85,400, approximately $3,300 lower than the other two closest bidders. Pending projects include a Pennsylvania highway bridge in McKean County, and a Pottsville, Pa., post office.

Imports

The following iron and steel imports were received here last week: 492 tons of steel sheets from Germany, and 75 tons of steel bars, 73 tons of structural shapes, 23 tons of steel bands and 3 tons of diamond plates from Belgium. During the previous week 849 tons of pig iron was received from the Netherlands and 101 tons of the same product from British India, together with 124 tons of steel tubes, 101 tons of steel bars, 99 tons of sponge iron, 28 tons of steel wire and 12 tons of steel forgings from Sweden.

Scrap

Leading brokers have maneuvered into a moderately well-covered position, and bids for additional tonnages to liquidate outstanding contracts are not quite so strong as they were a few weeks ago. The

market has a definitely steady undertone, however, and there is certainly no indication that brokers will attempt to revise their bids downward. With mill operations remaining steady, it is believed that the market is entering a period of temporary quietness. Brokers are more than willing to pay $12 for No. 1, $11.15 for No. 2 and $11 for heavy breakable cast. Other grades are quotably unchanged and are moving only occasionally. Phoenix continues to take deliveries on old No. 2 orders, but is temporarily out of the market for new tonnages. This company, however, is in the market for galvanized pipe plus 10 per cent cut beds at at an attractive price. Dealer deliveries to brokers are considerably under normal, largely as the result of a natural decline in the quantity of material available but partly because of the disinclination of small dealers to sell at current prices when general business sentiment is so bullish. This scarcity of scrap naturally concentrates attention on the few large scrap accumulations in the East. Boston Iron & Metal Co., Baltimore, has about six boats under the torch and a total of over 150,000 tons of steel will arise from this source over the next 18 months. Much of this material will probably go to export. The largest accumulation is the 175,000 tons held by Union Shipbuilding Co., Baltimore. This company, however, will not even commence liquidation until Baltimore prices reach $13, and even then the selling policy will be very conservative.

Die and Machine Shop Group Organized

THE Special Tool Die and Machine Shop Institute, which is undergoing a transition from a code authority to a trade association, held its annual meeting at the Statler Hotel in Cleveland, Sept. 14 and 15, and took further steps to perfect its organization in an industry which heretofore has not been represented by a trade association. Attendance included owners of shops having only four employees and representatives of some of the largest plants in that field. The organization in its two months' activities following code abandonment has enrolled a membership of 563.

During the two days' business session a standard of ethics was set up for the industry in a declaration of principles for the business conduct of members. These included strong resolutions against unethical sales practices and other acts of unfair competition. Principles governing employee relations were also adopted. The purposes and objectives of the institute both for the industry and for the institute members were fully covered in additions made to the by-laws. Cost and estimating systems were discussed by A. E. Grover, cost consultant for several industries.

The following directors were elected for a period of three years: Hans Buerk, president, Buerk Tool Works, Buffalo, reelected; N. A. Woodworth, president, Ex-Cell-O Aircraft & Tool Corpn., Detroit, reelected; R. J. Dunn, secretary, Hartford Special Machinery Co., Hartford, Conn.; C. R. Quine, president, Akron Equipment Co., Akron, and Rudolph Bernhardt, president Federal Tool Corpn., Chicago.

The present officers are expected to be reelected at an early meeting of the board. They are: President, F. S. Blackall, Jr., president, Taft-Peirce Mfg. Co., Woonsocket, R. I.; vice-president, N. W. Woodworth; treasurer, G. A. Barth, Barth Stamping & Mfg. Co., Cleveland, and secretary, George J. Huebner.

Production Rises to 66 Per Cent at Cleveland

Finished Steel Demand Improves Without Much Added Support from Motor Car Industry—Bolt and Nut Prices Reduced

CLEVELAND, Sept. 17.—Ingot output in the Cleveland-Lorain territory gained two points this week to 66 per cent of capacity. Demand for finished steel continues very good. Business is coming from diversified industries and the average size of orders has become somewhat larger. One leading local sales office entered more tonnage the past week than during any week since January. Consumers are not showing much interest in fourth quarter contracts and most orders are for early requirements.

However, forge shops are placing large orders for billets which they will place in stock this month before the Oct. 1 price advance. New orders for small lots of sheets continue to come from the automobile manufacturers and round-lot buying by that industry for new models is expected shortly. Miscellaneous business in sheets is rather heavy. Refrigeration manufacturers have commenced to buy for their new models and there is a good demand for enameling sheets from other sources, as well as for galvanized and electrical sheets. The construction field remains quiet. Railroad demand is limited to small miscellaneous lots. The Chesapeake & Ohio railroad is expected to issue its rail inquiry this week.

Pig iron sales continue heavy and some Lake furnaces have accumulated a very satisfactory backlog for the fourth quarter. Perry furnace at Erie is being blown in.

Bolt and nut manufacturers have made a slightly downward revision in prices.

Pig Iron

Spurred by the possibility of higher prices, consumers are purchasing iron for the fourth quarter, and some furnaces have more business on their books than at any previous time in two years. More iron was sold the past week than the previous week just following the opening of books for the remainder of the year, but the number of orders was smaller. Activity is confined to foundries and malleable grades, and large as well as small consumers are making commitments, some of the sales being in lots as large as 5000 tons. Buying in some cases is believed to be speculative. Business has come from the automotive, agricultural implement, radiator, sanitary ware and machine tool foundries. The peak of the buying spurt probably is passed, as inquiry tapered off this week. Shipments so far this month are 40 per cent higher than for the same period in August. Perry furnace of the Interlake Iron Corpn., at Erie, Pa., which has been out of blast for five years, is being blown in this week.

Bars, Plates and Shapes

Miscellaneous demand for merchant bars is well maintained. Orders for forgings are now being released by automobile manufacturers, and demand from forge shops is on the uptrend. Alloy steel bar business remains at recent volume. Structural shapes are moving fairly well. Demand for fabricated steel for small private work has gained. The Ingalls Iron Works has been awarded 200 tons for a building for the Niles Glass Works, Niles, Ohio. The only award of public work is 1250 tons of plates for the Elyria water main extension.

Sheets

While business from the automotive industry shows a slight increase, round-lot buying for new models has not materialized. Although there is some pressure for price concessions, it is not pronounced and there are no reports of shading. Refrigerator manufacturers, who have not been buyers for a long time, during the week purchased small lots of sheets for new models. Stamping manufacturers making parts for some of the lower-priced cars are specifying quite freely. Demand from stove manufacturers continues good.

Strip Steel

Miscellaneous demand is fair, but new business from the automotive industry continues light. Some of the leading parts manufacturers, which had been taking strip faster than needed, have held up shipments.

Iron Ore

Receipts at Lake Erie ports during August were 3,481,613 tons and for the season until Sept. 1 were 12,005,778 tons as against 11,039,201 tons during the same period last year. Shipments from these docks in August were 2,392,363 tons and for the season until Sept. 1 were 9,062,977 tons, as against 8,280,458 tons during the same period last year. Other than Lake Erie ports received this season, until Sept. 1, 4,776,278 tons as compared with 4,070,816 tons during the same period last year. The dock balance at Lake Erie ports Sept. 1, was 4,554,923 tons as compared with 4,855,814 tons on the same date a year ago.

Bolts and Nuts

New prices have been announced effective Sept. 12, representing a reduction of 2 to 3 per cent on machine, carriage, lag and plow bolts and on nuts. The new discount is 75 per cent off list as compared with the former price of 70, 10 and 5. Manufacturers hope that the reduction will cause the elimination of price concessions that have prevailed for some time. Tire bolts have been advanced to 60 off list, and elevator, ribbed carriage and step bolts to 70, these heretofore having carried an additional 5-point discount. Upward revisions have been made on cap and set screws. Bolt and nut business has improved over August. Good releases have just come from the automotive industry.

Warehouse Business

While jobbers will pay $2 more for galvanized sheets, because of withdrawal of that differential they expect for less-than-car lot orders to absorb the increased cost, but will add $2 a ton for car lots for direct mill shipment. Reflecting changes in mill prices, jobbers are making an upward revision of prices on wire products.

Scrap

A Cleveland consumer has bought several thousand tons of blast furnace scrap at $8.50, or 25c. a ton higher than it paid for its last purchase. Another purchase during the week was several thousand tons of heavy melting steel by a Valley consumer at $13.75. The market is again firmer, with an advance of 25c. a ton on heavy melting steel and blast furnace scrap. Dealers are paying $8.25 for borings and turnings for delivery to a local consumer. Scrap has been coming out so fast in the Youngstown district that some shipments have been held up.

Buffalo Rate Up To 41 Per Cent

BUFFALO, Sept. 17.—With Wickwire Spencer Steel Co. operating two furnaces, Lackawanna plant of the Bethlehem Steel Co., nine, and Republic Steel Corpn., four, open-hearth operations have risen to 41 per cent. The Seneca sheet division of Bethlehem is operating 60 per cent.

Reinforcing bar distributers and structural steel fabricators are interested in a number of State bridges which will be let between now and Oct. 1. To be placed this week are a 400-ton job in St. Lawrence County, a 200-ton project in Dutchess County and a 200-ton job in Herkimer. Three projects are to be let on Sept. 24, with a total of 350 tons of structural steel involved. Two jobs are in Jefferson County and one in Chautauqua County. Considerable structural steel is involved in a letting scheduled for the first of next month. In addition to the structural tonnage listed, most of the jobs will take small tonnages of reinforcing.

The feature of the scrap market is the decision of the district's largest consumer to pay $12 and $10.50 for No. 1 and No. 2 heavy melting steel instead of the previously listed offering prices of $11.50 and $10. While this concern is expected to get a certain amount of material at this price, dealers contend that no sizable tonnages of No. 1 or No. 2 can be had at this price. Sales of short rails at $14.75, Buffalo; No. 1 machinery cast at $12.50, and blast furnace scrap at $7.50 to $8 are noted.

Pig Iron Contracting Heavy at St. Louis

ST. LOUIS, Sept. 17.—Anticipating an advance in the price of pig iron, melters in the St. Louis territory are making commitments for full requirements for fourth quarter, abandoning hand-to-mouth buying. It is understood that buying for the last quarter has been heavier than the early purchases for any quarter in the last two years. The stove plants in Belleville, Tricities and Hannibal are said to be operating to the limit, having stepped up their manufacturing a day a week beginning yesterday. Reports from the agricultural implement manufacturing centers also tell of heavy operations.

The City of St. Louis has voted a bond issue of $7,500,000, which with an expected grant of $21,015,000 by the PWA will be used to build a Thomas Jefferson Memorial on the Mississippi River front. An $800,000 bond issue also was voted, which, with a $333,900 PWA grant, will be used to complete approaches to the municipal bridge. Operations of the seven large structural fabricating plants in the district have been increased 5 per cent to 30 per cent, because of highway bridge contracts and small industrial jobs.

Mills in the St. Louis industrial district, having bought scrap fairly heavily several weeks ago, are marking time, and the market is quiet. A quieting factor also is the lack of interest in the Valley and Chicago centers. The only price change is that of railroad malleable, which advanced $1.25 a ton, and is very strong. The Missouri Pacific list of 70 carloads of scrap, which was sold last week, went to Western points. The Missouri-Kansas-Texas offers approximately 1000 tons to be sold during the week.

Half-Cent Advance in Copper Lends Strength to All Non-Ferrous Metals

Heavy Buying of Red Metal Accompanies Boost to Old Code Level—Lead and Zinc Unchanged—Tin Higher

NEW YORK, Sept. 17.—Extraordinary demands for copper which occurred last week were largely responsible for the decision of producers to advance the price to 9c., Valley. Whereas yesterday's bookings have not been definitely determined, it is authoritatively stated that they were in the neighborhood of 30,000 tons, possibly even higher. Along with the week end's heavy turnover, this brought total bookings for the month through Monday to 68,000 tons. The ever increasing likelihood of war between Italy and Ethiopia plus the corollary defensive measures being undertaken by European nations generally is, in part, responsible for the prevailing condition of the market. But a good amount of the business transacted must be attributed to purely normal circumstances. Buyers are resuming purchases in anticipation of substantial fall business. According to statistics released yesterday, world stocks were reduced in August by 16,870 tons, approximately nine tenths of the reduction occurring in American supplies. Consumption abroad has not kept pace with domestic activity. Total stocks on Aug. 31 were put at 248,571 tons in this country and at 301,259 tons abroad. Last week's sales were for well diversified fourth quarter delivery with inquiries coming from practically all sources of consumption.

Lead

Enlivened activity in this market ensued naturally last week as a result of the substantial gains made by copper. Sales for September and October delivery were made in good volume, and demand was from representative sources. Talk of higher prices is strongly in evidence, but no changes have yet been made from existing levels of 4.20c. a lb., St. Louis, and 4.35c., New York. Strong possibility exists, however, that an upward revision will be introduced at almost any time. Sellers have been hesitant about making commitments to other than regular customers at current price ranges. Higher prices would largely dispel this attitude. Whether or not the market will become saturated before the price is changed remains to be seen.

Zinc

The leading interests view the present market situation with satisfaction, and there is now talk of higher prices. Bookings last week totaled 4200 tons as compared with 2324 tons in the week before. There is a steady flow of shipments to consumers on previously booked orders. It is thought that when these become exhausted a new buying wave will set in. Ore producers are in no hurry to feed the market, and this situation is somewhat aggravating to sellers of the refined metal whose profit yield, it is stated, is currently unduly small. The demand which was satisfied last week was for well-rounded fourth quarter delivery. Prices on Prime Western continue at 4.60c. a lb., East St. Louis, and 4.97½c., New York.

Tin

In decided contrast with other non-ferrous markets, the domestic tin situation continues with turnover at a minimum. Sellers are finding practically no outlet for their product. Reports to the effect that the market may be underbought are ascribed to bullish interests attempting to foster belief in an impending purchasing wave which would raise the price. If anything, the reverse is true. Tin plate producers, who went in for rather heavy mid-summer commitments on the basis of the then existing operating rate of 85 per cent of capacity, are now endeavoring to stall off deliveries. With mill operations currently at only 55 per cent of capacity, the tin plate industry finds itself oversupplied with metal. Its action in holding up deliveries of metal already contracted for serves to depress the domestic market even further. Straits tin sold here today at 49.50c. a lb. as against 48.25c. a week ago. Standard metal at London this morning was quotable at £226 for spot and £214 for futures, while in the East quotations were at £221.

The Week's Prices. Cents Per Pound for Early Delivery

	Sept. 11	Sept. 12	Sept. 13	Sept. 14	Sept. 16	Sept. 17
Electrolytic copper, N. Y.*	8.25	8.25	8.25	8.25	8.75	8.75
Lake copper, N. Y.	8.62½	8.62½	8.62½	8.62½	9.12½	9.12½
Straits tin, spot, New York	48.55	49.00	49.12½	....	49.62½	49.50
Zinc, East St. Louis	4.60	4.60	4.60	4.60	4.60	4.60
Zinc, New York†	4.97½	4.97½	4.97½	4.97½	4.97½	4.97½
Lead, St. Louis	4.20	4.20	4.20	4.20	4.20	4.20
Lead, New York	4.35	4.35	4.35	4.35	4.35	4.35

*Refinery quotations; price ¼c. higher delivered in Connecticut.
†Includes emergency freight charge.

Aluminum, virgin 99 per cent plus, 19c. to 21c. a lb., delivered.
Aluminum, No. 12 remelt, No. 2 standard, in carloads, 16.50c. a lb., delivered.
Nickel, electrolytic, 35c. to 36c. a lb. base refinery, in lots of 2 tons or more.
Antimony, Asiatic, 13.50c. a lb., New York.
Quicksilver, $69 to $71 per flask.
Brass ingots, commercial 85-5-5-5, 8.50c. a lb., delivered; in Middle West ¼c. a lb. is added on orders for less than 40,000 lb.

From New York Warehouse

Delivered Prices, Base per Lb.

Tin, Straits pig	50.50c. to 51.50c.
Tin, bar	52.50c. to 53.50c.
Copper, Lake	10.00c. to 11.00c.
Copper, electrolytic	10.00c. to 11.00c.
Copper, castings	9.75c. to 10.75c.
*Copper sheets, hot-rolled	16.00c.
*High brass sheets	14.37½c.
*Seamless brass tubes	16.12½c.
*Seamless copper tubes	16.50c.
*Brass rods	12.87½c.
Zinc, slabs	5.75c. to 6.75c.
Zinc, sheets (No. 9), casks, 1200 lb. and over	10.25c.
Lead, American pig	4.85c. to 5.85c.
Lead, bar	5.85c. to 6.85c.
Lead, sheets	8.00c.
Antimony, Asiatic	14.50c. to 15.50c.
Alum., virgin, 99 per cent, plus	23.30c.
Alum., No. 1 for remelting, 98 to 99 per cent	18.00c. to 19.00c.
Solder, ½ and ½	30.00c. to 31.00c.
Babbitt metal, commercial grades	25.00c. to 60.00c.

*These prices are also for delivery from Chicago and Cleveland warehouses.

From Cleveland Warehouse

Delivered Prices per Lb.

Tin, Straits pig	54.75c.
Tin, bar	56.75c.
Copper, Lake	9.50c.
Copper, electrolytic	9.50c.
Copper, castings	9.25c.
Zinc, slabs	6.00c. to 6.25c.
Lead, American pig	4.95c. to 5.30c.
Lead, bar	8.25c.
Antimony, Asiatic	15.50c.
Babbitt metal, medium grade	19.25c.
Babbitt metal, high grade	58.75c.
Solder, ½ and ½	31.75c.

Old Metals, Per Lb., New York

Buying prices are paid by dealers for miscellaneous lots from smaller accumulators, and selling prices are those charged to consumers after the metal has been prepared for their uses. (All prices are nominal.)

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, hvy. crucible	6.12½c.	6.87½c.
Copper, hvy. and wire	6.00c.	6.50c.
Copper, light and bottoms	5.00c.	5.50c.
Brass, heavy	3.37½c.	4.00c.
Brass, light	2.62½c.	3.37½c.
Hvy. machine composition	5.50c.	6.00c.
No. 1 yel. brass turnings	4.62½c.	5.12½c.
No. 1 red brass or compos. turnings	5.00c.	5.50c.
Lead, heavy	3.25c.	3.62½c.
Zinc	2.37½c.	2.75c.
Cast aluminum	11.62½c.	12.75c.
Sheet aluminum	12.75c.	14.25c.

Changes in Board Of Republic Planned

ADDITIONS to the board and executive staff of the Republic Steel Corpn. are announced in the prospectus of the Republic Steel Corpn. covering its refinancing program which, with the acquisition of the Corrigan, McKinney Co. and control of the Truscon Steel Co., will be submitted to stockholders for approval at an adjourned meeting to be held in Jersey City, Sept. 23.

Donald B. Gilles, president Corrigan, McKinney Co., will become a director and an executive officer of Republic on consummation of the merger, and three new directors of the Republic corporation are named. They are Henry K. Bourne, secretary and director Oglebay, Norton & Co., Cleveland; Harvey H. Brown, Jr., Cleveland, vice-president and director of Stewart Furnace Co., and Oscar L. Cox, deputy superintendent of banks in charge of liquidation of the Union Trust Co., Cleveland. In additon, Julius Kahn, president and director Truscon Steel Co., Youngstown, is slated to become a director of Republic in case control of the Truscon company is acquired.

Pipe Lines

Independent Natural Gas Producers of Montana, E. B. Coolidge, Great Falls, Mont., president, in cooperation with group of communities in North Dakota, Minnesota and Wisconsin, is applying for Federal aid in gross sum of $60,000,000 for construction of welded steel pipe line from natural gas fields in Montana to points in three States noted, with pipe lines for commercial gas service in different municipalities, including distribution systems. Different communities have named representatives to cooperate in necessary Federal financing, headed by John W. Schmidt, Anoka, Minn.

Sinclair Refining Co., Houston, Tex., plans welded steel pipe lines for new natural gas gathering system in Joiner gas fields, east Texas district. Rights of way are being secured for about 200 miles of such lines, to furnish natural gas to new natural gasoline extraction plant to be located near Wright City, Smith County, Tex. Cost over $500,000. Company headquarters are at 45 Nassau Street, New York.

Pacific Gas & Electric Co., San Francisco, has let contract to Youdall Construction Co., Matson Building, for about 31½ miles of 22-in. welded steel pipe from point near San Francisco-San Mateo County line to vicinity of Palo Alto, Cal., for natural gas supply. Line will form section of 45-mile pipe line extending to source of supply in Kettleman Hills natural gas fields, remaining 13½ miles to be built under another contract or by company forces. Award for 8600 tons of 22-in. electric-welded steel pipe has been made to Western Pipe & Steel Co., San Francisco, at price of about $800,000. Entire line will cost about $1,500,000.

City Council, Lansing, Mich., is applying for Federal loan and grant, totaling about $600,000, for welded steel pipe line from natural gas fields in State to city limits, for commercial supply. Steel pipe lines for distribution will be built. Leo J. Smith is chairman of natural gas committee in charge.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Oct. 4 for 17,120 ft. of welded steel pipe for Eastern or Western navy yards (Schedule 5996).

United States Engineer Office, Missouri River Division, Kansas City, Mo., asks bids until Sept. 24 for steel discharge pipe, with extra heavy elbows, connection pipe, suction pipe manhole, discharge pipe manholes, flanges, etc. (Circular 14).

Extras on Automobile Spring Steel Revised

THE card of size extras on automobile spring steel flats has been revised to designate thickness in decimals instead of gages. Regular bar extras for quantity, cutting and chemical requirements will apply. New size extras are as follows:

Alloy and Carbon Open-Hearth Spring Steel

Width, In.	Thickness, In.	Extra, per 100 Lb.
1¼ to 6	0.230 to 0.750	Base
1 to 1⅛	0.320 to 0.500	Base
1 to 1⅛	0.230 to 0.320	$0.10
1 to 6	0.210 to 0.230	0.15
1 to 6	0.190 to 0.210	0.20
1 to 6	0.170 to 0.190	0.25
Alloy Spring Steel		
¾ to 1⅛	0.170 to 0.320	0.25
⅝ to 1⅛	0.170 to 0.320	0.50
⅝ to 6	0.130 to 0.170	0.50
¾ to 3	0.060 to 0.130	0.75
¾ to 3	0.035 to 0.060	1.10
⅝ to ⅝	0.140 to 0.170	1.10
⅜ to ⅝	0.060 to 0.140	2.00
⅜ to ⅝	0.035 to 0.060	2.50
⅜ to ⅝	0.020 to 0.035	3.00
Carbon Open-Hearth Steel		
1 to 6	0.130 to 0.170	0.50

PWA Fund Reduction Minimized by Ickes

WASHINGTON, Sept. 17.—Reduction of the $900,000,000 PWA fund to $425,000,000 is not a serious blow to PWA, according to Harold I. Ickes, public works administrator, in commenting on revision by the President of the works program.

While still favoring use of funds for permanent works, Mr. Ickes declared at a press conference that he had a virtual free hand in choosing PWA projects and that Harry L. Hopkins, works progress administrator, merely advised him of the condition of unemployment in areas of proposed projects to be considered by Mr. Ickes in arriving at a decision. The 2000 PWA projects rejected by Mr. Hopkins, the Public Works Administrator said, can be revised and reconsidered if they meet with requirements of the President as to cost and time of completion.

No meeting was held today to consider unallocated portions of the works relief fund and the original deadline for receiving applications set for today was eliminated because of the revised program arranged by the President. The only stipulation now, Mr. Ickes said, is that contract work be let by Dec. 15.

Fabricated Structural Steel

Lettings in Fair Volume—New Projects Lower

AMONG awards of 14,750 tons, which compare with 25,650 tons last week, bookings of size include 3000 tons for a plant for the International Harvester Co., Chicago, 2050 tons for a dam in the Mississippi River at Genoa, Wis., and 1000 tons for a post office at Atlantic City, N. J. New projects of 9955 tons are mostly for small tonnages and compare with 10,450 tons in the previous week and 15,520 tons two weeks ago. The outstanding new job is 3300 tons for the first section of the Sixth Avenue subway in New York, from Fortieth to Forty-seventh Streets. Plate lettings call for 2695 tons, with 3200 tons pending. Structural steel awards for the week follow:

NORTH ATLANTIC STATES

Hamden, Conn., 115 tons, Ives Street bridge, to American Bridge Co.

New York, 300 tons, East River pier shed for Washburn Wire Goods Co., to National Bridge Works.

Mahopac, N. Y., 225 tons, grammar and high school, to Belmont Iron Works.

Atlantic City, N. J., 1000 tons, post office, to an unnamed bidder.

Philadelphia, 200 tons, manufacturing building for Charles Lennig & Co., Inc., to Frank M. Weaver & Co., Inc.

Camden, N. J., 860 tons, South Jersey port commission cargo buildings, to Belmont Iron Works.

Rimerton, Pa., 665 tons, lock and dam, Allegheny River, to Independent Bridge Co.

SOUTH AND SOUTHWEST

Owensboro, Ky., 250 tons, distillery, to International Steel Co.

State of Kentucky, 100 tons, highway bridge in Harlan County, to Vincennes Bridge Co.

State of New Mexico, 185 tons, bridge, to Minneapolis-Moline Power & Implement Co.

CENTRAL STATES

Terre Haute, Ind., 250 tons, Owens Illinois Glass Co., to Mississippi Valley Structural Steel Co.

Zanesville, Ohio, 215 tons, transmission towers, to American Bridge Co.

Niles, Ohio, 200 tons, building for Niles Glass Works, subsidiary of General Electric Co., to Ingalls Iron Works Co.

Columbus, Ohio, 200 tons, building for sewage disposal plant, to an unnamed Columbus fabricator.

Flat Rock, Mich., 200 tons, State highway bridge, to R. C. Mahon Co.

State of Michigan, 140 tons, highway bridge, to Jones & Laughlin Steel Corpn.

Detroit, 850 tons, plant for American Blower Corpn., to R. C. Mahon Co.

Detroit, 305 tons, buckstays for Ford Motor Co., to Babcock & Wilcox Co.

Detroit, 200 tons, broadcasting station for Detroit News, to Whitehead & Kales, Inc.

Chicago, 3000 tons, International Harvester Co. buildings: 1000 tons each, to Gage Structural Steel Co., Hansell-Elcock Foundry Co. and Vierling Steel Works.

Chicago, 150 tons, Murray Wolbach Co. building, to Wendnagel & Co.

State of Minnesota, 105 tons, bridge, to Minneapolis-Moline Power & Implement Co.

Pekin, Ill., 180 tons, school gymnasium, to Hansell-Elcock Foundry Co.

Clarke County, Iowa, 115 tons, bridge, to Pittsburgh-Des Moines Steel Co.

Wellman, Iowa, 350 tons, bridge, to Clinton Bridge Works.

Genoa, Wis., 2050 tons, dam No. 8, to Treadwell Construction Co.

WESTERN STATES

Boulder City, Nev., 635 tons, transmission towers, Bureau of Reclamation, to American Bridge Co.

State of Montana, 185 tons, bridge, to Minneapolis-Moline Power & Implement Co.

Flathead County, Mont., 342 tons, State bridge over Flathead River, to an unnamed bidder.

State of Wyoming, 202 tons, bridges in four counties, to unnamed bidders.

Garfield, Utah, 160 tons, smelter, to Kansas City Structural Steel Co.

Cowlitz County, Wash., 330 tons, State bridge over Toutle River, to Wallace Bridge & Structural Steel Co.

Seattle, 100 tons, two hoists for Landsburg dam, to Puget Sound Machinery Depot.

Seattle, 130 tons, radio tower, to Truscon Steel Co.

Grotto, Wash., 100 tons, addition for Northwest Portland Cement Co., to Isaacson Iron Works.

Alhambra, Cal., 100 tons, post office, to Minneapolis-Moline Power Implement Co.

Los Angeles, 100 tons, tunnel forms for Metropolitan Water District, Specification No. 122, to Consolidated Steel Corpn.

NEW STRUCTURAL STEEL PROJECTS

NORTH ATLANTIC STATES

Worcester, Mass., 200 tons, parcel post building.

St. Lawrence County, N. Y., 400 tons, State bridge; bids Sept. 17.

Dutchess County, N. Y., 200 tons; State bridge; bids Sept. 17.

Herkimer County, N. Y., 200 tons; State bridge; bids Sept. 17.

Jefferson and Chautauqua Counties, N. Y., 350 tons, three bridges; bids Sept. 24.

New York, 3300 tons, first section Sixth Avenue subway, Fortieth to Forty-seventh streets; bids to be taken by Board of Transportation Oct. 4.

New York, 125 tons, extension of vehicular tunnel approach to George Washington bridge on Manhattan side; bids Oct. 11.

Hoboken, N. J., 400 tons, addition to Davis Baking Co.; bids Sept. 11.

Schenectady, N. Y., 290 tons, building for American Locomotive Co.

SOUTH AND SOUTHWEST

Burlington, N. C., 100 tons, tobacco warehouse.

Memphis, Tenn., 200 tons, seed warehouse.

Jackson, Ky., 160 tons, bridge.

Butler, Ky., 525 tons, bridge.

Corinth, Miss., 100 tons, TVA gantry cranes.

Stuart, Fla., 415 tons, bridge over St. Lucie River for Florida East Coast Railway.

Fort Smith, Ark., 400 tons, post office.

State of Arkansas, 325 tons, bridges.

State of Oklahoma, 250 tons, bridges.

Tallahassee, Fla., 300 tons, post office and courthouse.

CENTRAL STATES

Monsanto, Ill., 100 tons, Monsanto Chemical Co.

State of Wisconsin, 850 tons, bridges.

Milwaukee Road, 175 tons, bridge at Madison, Wis.

WESTERN STATES

State of Colorado, 360 tons, highway bridges.

Los Angeles, 100 tons, tunnel forms, Pacific Iron & Steel Co., low bidder.

Los Angeles, 130 tons, crane for Department of Water & Power, Judson-Pacific Co. low bidder.

FABRICATED PLATES

AWARDS

Elyria, Ohio, 1250 tons, water main extensions, to C. F. Little Co., Sioux City, Iowa, spiral welded pipe to be furnished by American Rolling Mill Co.

Everett, Wash., 275 tons, pipe line from reservoir No. 2 to Weyerhaeuser Pulp Mill, to Puget Sound Machinery Depot.

Avila, Cal., 1167 tons, pipe line for Union Oil Co. to an unnamed bidder.

NEW PROJECTS

New York, 1200 tons, five barges for Pan-American Petroleum Corpn.

Denver, 200 tons, high pressure gates for Pine View dam; bids opened.

Defiance, Ariz., 1400 tons, tanks; bids soon.

Glasgow, Mont., 400 tons, 28-in. dredge pipe for Fort Peck dam; bids Sept. 30.

SHEET PILING

NEW PROJECTS

New York, 500 tons, Contract 45, Triborough bridge; Woodcrest Engineering Co., general contractor.

Portland, Ore., 220 tons sheet piling, bulkhead for United States Engineers; bids Sept. 19.

Cast Iron Pipe

Concord, N. H., has awarded a tonnage of 6, 8 and 12-in. to United States Pipe & Foundry Co.

Dover, Minn., has authorized bond issue of $25,000 for pipe lines for water system, including elevated steel tank and tower. Financing will be carried out through Federal aid. Ealy G. Briggs, 1957 University Avenue, St. Paul, is consulting engineer.

Miami, Fla., has applied for Federal loan and grant for $500,000 for extensions and replacements in water pipe lines in different parts of city. William Sydow, public service director, is in charge.

Alvord, Tex., plans pipe lines for water supply. Fund of $70,000 is being arranged through Federal aid for this and other waterworks installation.

Tacoma, Wash., has secured fund of $243,000 for pipe water lines in different parts of city and other waterworks improvements. Additional financing for $297,000 to complete project will be arranged later.

Jeromesville, Ohio, plans pipe lines for water system. Fund of $24,900 has been arranged through Federal aid for this and other waterworks installation, including reservoir. Murray D. Shaffer, Richland Trust Building, Mansfield, Ohio, is consulting engineer.

Liberty, Mo., plans new water trunk line from water station at South Liberty to city. Financing for $100,000 is being arranged. W. E. Barnes is city engineer.

Blue Mountain, Miss., plans pipe lines for water system. Fund of $39,000 is being arranged through Federal aid for this and other waterworks installation. Beard Engineering Co., 44 South Central Avenue, Clayton, St. Louis, is consulting engineer.

Omega, Ga., plans pipe lines for water supply. Fund of $22,725 is being secured through Federal aid for this and other waterworks installation.

Lyons, Ind., will soon take bids for about 20,700 ft. of 4 to 8-in. for water system; also for 60,000-gal. elevated steel tank and tower, and other waterworks equipment. O. T. Hancock, Plainfield, Ind., is consulting engineer.

Dyersburg, Tenn., plans pipe lines for water supply. Fund of $75,000 is being arranged through Federal aid for this other waterworks installation.

Oshkosh, Wis., plans pipe lines for water supply, including extensions in present system and replacements. Fund of $71,875 is being arranged through Federal aid. A. E. Hintz is manager of water department, in charge.

Bellevue, Ohio, will soon take bids for pipe lines for water supply, including extensions in present system and replacements; also for new high-speed pumping station, filtration plant and other waterworks construction. Fund of $191,000 has been arranged through Federal aid. George P. Gascoigne & Co., Leader Building, Cleveland, are consulting engineers.

Marceline, Mo., plans pipe lines for water system. Fund of $124,000 is being arranged through Federal aid for this and other waterworks installation. Black & Veatch, 4706 Broadway, Kansas City, Mo., are consulting engineers.

Advance, Mo., has voted a bond issue of $40,000 for a waterworks system. Conzelman & Co., St. Louis, are engineers.

Seattle has opened bids on 230 tons of 12-in.

Pittsburgh Steel Co. and subsidiaries, Pittsburgh, in the fiscal year ended June 30, had net loss of $1,675,353, compared with net loss of $1,330,390 in 1934.

Vanadium-Alloys Steel Co. and subsidiaries, Latrobe, Pa., in the year ended June 30, had net profit of $357,377, equal to $1.77 a share on common stock compared with $293,280, or $1.45 a share in the preceding year.

Bench Power Press Features Safety

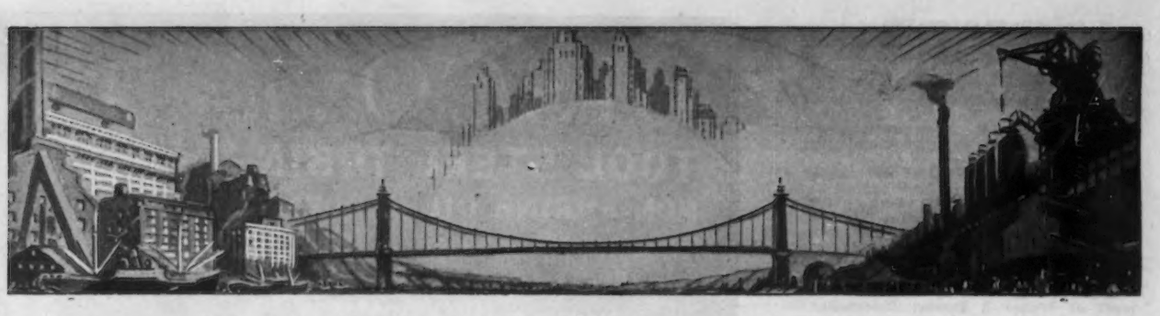
(CONTINUED FROM PAGE 36)

lifted until the clutch has disengaged.

A connection, or pitman, at the rear provides a ⅜ in. tool-slide adjustment, up or down. Three strokes, ¾, 1¼ and 2 in. are obtainable by a fulcrum-pin change in the rocker arm connecting the pitman and gate, or tool-slide. The shut height (bed to slide, when down) is 3¾ in. standard, and 6 in. maximum. The press may be bench or cast-iron table mounted. The bench space is 17 x 19 in. The floor space, 20¾ x 21¼ in. Weights: Bench press, 300 lb. Floor press, 450 lb. A ¼ hp. motor, 1800 r.p.m., gives a flywheel speed of 300 r.p.m.

The Carnegie Steel Co., Pittsburgh, has been awarded contract by the Amtorg Trading Corpn., New York, to furnish the Russian Government with 2250 tons of car axles for immediate delivery. The axles will be made at the Howard Axle plant of the Homestead Steel Works, West Homestead, Pa., and will require from six to eight weeks for completion.

Rust Inhibitor. — Truscon Laboratories, Detroit. Bulletin No. 403 entitled "Paint Over Rust," describing a new rust inhibitor known as Bar-Ox Formula 97.



Plant Expansion and Equipment Buying

Buying is Heavy at Machine Tool Exposition

ORDINARILY, exhibitors at machine tool shows or expositions do not expect to do a "floor or shelf to customer" business. In the past, machine tool buying has required considerable deliberation and the effect of showing one's wares has become apparent only after a thoughtful interlude. This time, precedent has been smashed, for a preliminary canvass of those represented at Cleveland shows that sales are the rule and not the exception. Naturally, customers do not come provided with order blanks, but the verbal commitments from responsible companies already run into seven figures and with lively prospects of more to come.

Added to the appeal of pronounced advances in design and operating efficiency is the threat of delayed deliveries and also that of inflation. All three of these forces are combining to make real business at Cleveland.

NORTH ATLANTIC

Standard Sanitary Mfg. Co., 18 East Forty-fifth Street, New York, has plans for new one-story factory branch, storage and distributing plant, 40 x 190 ft., at Long Island City. Cost over $40,000 with equipment. Company is a division of American Radiator & Standard Sanitary Corpn., 40 West Fortieth Street, New York.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Sept. 27 for one electric arc welding set (Schedule 5890), steel and asbestos ring gaskets (Schedule 5968) for Brooklyn Navy Yard; until Sept. 24, 12 motor-driven forced-draft blowers and spare parts (Schedule 5964) for Brooklyn and Philadelphia yards; low-pressure gate valves (Schedule 5958), pressure reducing steam valves and spare parts (Schedule 5949) for Brooklyn, Philadelphia and Charleston, S. C., yards; until Sept. 27, one gasoline engine-driven tractor, one gang lawn mower, one revolving scraper (Schedule 5999), for New York or Philadelphia yard.

Disbrow & Schwab, 25-09 Forty-second Street, Long Island City, plumbing and heating equipment and supplies, has leased building at Twenty-third Street and Forty-fourth Road, for new storage and distributing plant.

Board of Village Trustees, New Hyde Park, N. Y., plans new municipal electric light and power plant. Cost about $300,000 including power lines. Financing is being arranged through Federal aid. Clyde Potts, 30 Church Street, New York, is consulting engineer.

Chevrolet Motor Co., 3044 West Grand Boulevard, Detroit, has let general contract to J. K. Turton, Inc., 248 West Thirty-fourth Street, New York, for one-story addition to branch assembling works at Tarrytown, N. Y. Cost over $500,000 with equipment.

South Jersey Port Commission, Camden, N. J., will soon take bids for extensions and improvements at local marine terminal on Delaware River, including one-story storage and distributing building, 400 x 1000 ft., and two smaller similar units, pumping station, boiler house and miscellaneous work, with installation of mechanical-handling, loading and other equipment. Fund of $560,000 has been secured through Federal aid. It is proposed to begin work in October.

State Highway Department, State House Annex, Trenton, N. J., asks bids until Sept. 23 for two boilers and auxiliary equipment for boiler plant at Passaic River Bridge, Route 25.

Rahway Valley Joint Meeting, 37 Elm Street, Westfield, N. J., asks bids until Sept. 26 for pumping machinery and accessories, sludge grinding equipment, digestion tank covers, steel superstructure, electrical equipment, etc., for new sewage treatment plant. Fuller & McClintock, 11 Park Place, New York, are consulting engineers. William Darroch is secretary and treasurer.

Commanding Officer, Frankford Arsenal, Philadelphia, asks bids until Sept. 25 for one double disk grinder (Circular 68).

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Sept. 24 for 60 crucibles without cover (Schedule 5993); until Sept. 27, 18,000 pneumatic chisel blanks (Schedule 6005), for Philadelphia Navy Yard.

SOUTH ATLANTIC

Southern Marine Engineering Co., Pensacola, Fla., care of S. P. Robineau, First Trust Building, Miami, Fla., representative, plans shipbuilding and repair plant at Pensacola, where negotiations are under way with City Council for about 4500 ft. of waterfront lands. Plant will include shops, power house and other mechanical departments. Cost over $400,000 with equipment. Financing is being arranged through RFC. William Buchsbaum, an official of Barstow, Tyng & Co., Inc., 70 Pine Street, New York, is interested in Southern company.

United States Engineer Office, Charleston, S. C., asks bids until Sept. 23 for one double pumping unit, complete (Circular 20).

NEW ENGLAND

Commanding Officer, Springfield Armory, Springfield, Mass., asks bids until Sept. 24 for one snow plow, 24 in. wide and 10 ft. long (Circular 21); until Sept. 25, parts for thread milling machine (Circular 16); until Sept. 26, cams and tools (Circular 14).

Bridgeport Brass Co., Housatonic Avenue, Bridgeport, Conn., has asked bids for one-story addition, 52 x 150 ft., with L-extension, 40 x 60 ft. Two craneways will be installed. Cost over $45,000 with equipment. Fletcher-Thompson, Inc., 1336 Fairfield Avenue, is architect and engineer.

State Department of Public Institutions, State House, Augusta, Me., will soon take bids for new steam power plant, with mechanical laundry unit, at institution at Skowhegan, Me., for central heating service. Cost about $65,000 with equipment. Plans are also being completed for extensions and improvements in power plants at institutions at Presque Isle and Hallowell, Me., for central heating. A. J. Thayer Co., 2 Spring Street Extension, Auburn, Me., is consulting engineer for all projects.

Wehle Brewing Co., Campbell Avenue, West Haven, Conn., has let general contract to Fusco-Amatruda Co., Amity Road, New Haven, Conn., for two-story mechanical bottling works, 58 x 101 ft. Cost over $45,000 with equipment.

BUFFALO DISTRICT

Rochester Distilling Co., 8 Exchange Street, Rochester, N. Y., recently organized, has purchased former local refinery of Vacuum Oil Co., lately held by Socony-Vacuum Oil Co., New York, and will remodel for new distillery. Complete new equipment will be installed for all departments. Cost about $375,000 with machinery. S. Firestone, 59 South Avenue, is architect and engineer.

Bell Aircraft Corpn., Buffalo, recently formed by Lawrence D. Bell and associates, has taken possession of lately vacated plant of Consolidated Aircraft Corpn., 2050 Elmwood Avenue, for manufacture of military airplanes, including parts production and assembling. List of tools and equipment to be installed is being arranged and orders will be placed soon. Mr. Bell was formerly vice-president and general manager of Consolidated company, which has transferred operations to San Diego, and will be president of new organization; Ray P. Whitman is vice-president and treasurer.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The pacemaker in
wire rope development
THE most exacting basis for judging wire rope performance is AVERAGE SERVICE.
It is the basis advocated by Roebling, in which rope cost per ton of material handled, or per other unit of service measurement, is based not on the service of a single rope but on the *average* service of several ropes.
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JAR
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◀ WESTERN PA. DIST. ▶

Joseph Finch Co., Schenley, Pa., has let general contract to Frank Messer & Son, 2543 Burnet Avenue, Cincinnati, for two-story and basement addition to local distillery. Cost over $45,000 with equipment. Carl J. Kiefer, Schmidt Building, Cincinnati, is consulting engineer.

Standard Specialty & Tube Co., New Brighton, Pa., manufacturer of metal specialties, collapsible metal tubing and allied products, has begun erection of two-story addition. Company will also make improvements in boiler plant, with installation of new equipment. Cost over $40,000 with equipment.

◀ MIDDLE WEST ▶

Chicago Transformer Corpn., 2626 West Washington Boulevard, Chicago, has leased one-story factory, 120 x 300 ft., at 3501-21 Addison Street, including one-story to be erected at once, for new works, providing large increase in present capacity. Cost over $75,000 with equipment.

Board of Water Commissioners, Red Wing, Minn., asks bids until Sept. 24 for one horizontal booster centrifugal pump, with motor, control and auxiliary equipment. J. F. Enz is city engineer.

Central Nebraska Power and Irrigation District, Hastings, Neb., R. O. Canady, secretary, recently organized, has secured approval of loan and grant of $25,000,000 from PWA, for new hydroelectric power and irrigation development. A power dam will be located on Platte River, near North Platte, Neb. Project will include three hydroelectric generating stations, with transmission and distributing lines, power substation and switching facilities, and other structures; also electric-operated pumping stations in connection with irrigation of about 500,000 acres in Gosper, Phelps, Adams and Kearney counties. Work will begin soon. George E. Johnson, Hastings, is consulting engineer.

Hall Hardware Co., 618 North Third Street, Minneapolis, builders' and other hardware products, has let general contract to James Leck Construction Co., 211 South Eleventh Street, for four-story top addition to present storage and distributing plant, 124 x 146 ft. Cost over $125,000 with equipment. E. J. Prondzinski, Civic and Commerce Building, is architect.

Allis-Chalmers Mfg. Co., Milwaukee, will invest $175,000 in remodeling and enlarging branch plant at La Port, Ind., for enlarged production of new harvesting combine recently perfected. An idle foundry will be renovated for increased output.

Wolf River Hydro Electric Co., Antigo, Wis., Harry S. Brooks, general manager, has plans by J. S. Hart, consulting engineer, Madison, Wis., for new dam and power house on Wolf River near Antigo. Cost about $50,000.

Hochgreve Brewing Co., Route 6, Green Bay, Wis., has placed general contract with J. C. Baseton, 1857 Willow Street, Green Bay, for five story addition, 50 x 60 ft., and one-story wing, 25 x 27 ft. Architects are Richard Griesser & Son, 64 West Randolph Street, Chicago.

Board of Vocational Education, Superior, Wis., Rudolph Hansen, director, has plans by Roland C. Buck, Inc., 201 Telegram Building, local, for vocational school addition, 88 x 140 ft., three stories and basement. Cost about $190,000.

◀ OHIO AND INDIANA ▶

Western Automatic Machine Screw Co., Engineers Building, Cleveland, has let general contract to Sam W. Emerson Co., 1836 Euclid Avenue, for one-story addition to plant at Elyria, Ohio, 190 x 209 ft. Cost about $125,000 with equipment. John B. Fischer, 7322 Lafayette Street, Chicago, is architect. B. C. Franklin is manager at plant.

David Round & Son, Henry Street and Pennsylvania Railroad, Cleveland, manufacturers of chain hoists, chains, etc., have let general contract to Boldt-Rapp Co., 2175 Ashland Road, for two-story addition, 50 x 160 ft. Cost over $60,000 with equipment. H. W. Maurer, 3126 Scarborough Road, is architect.

Ohio Oil Co., Findlay, Ohio, manufacturer of refined oils, has let general contract to Austin Co., Cleveland, for one-

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Harrisburg presents an eighty-page catalog containing complete purchasing information about seamless steel, plate-made gas cylinders; drop and hollow forgings; drop-forged pipe flanges; seamless steel pipe couplings and bull plugs; seamless steel pump liners; pipe coils and bends; carbon and alloy steels. We shall gladly send a copy upon request.

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HARRISBURG STEEL CORPORATION

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story addition. Cost about $40,000 with equipment. Company has also awarded contract for three-story office and operating building to Sam W. Emerson Co., Cleveland. Wilbur Watson & Associates, 4614 Prospect Avenue, Cleveland, are architects.

Automatic Reclosing Circuit Breaker Co., 1304 Indianola Avenue, Columbus, Ohio, plans new one-story plant. Cost about $70,000 with machinery. T. W. Brooks, 683 East Broad Street, is architect.

Contracting Officer, Material Division, Air Corps, Wright Field, Dayton, Ohio, asks bids until Sept. 25 for heater shell braces, air intake support lower brace clamp assemblies, sleeve lugs, air intake support upper bracket clamp assemblies (Circular 174); until Sept. 23, 675 carburetor air screen assemblies (Circular 177); until Sept. 30, one inflation net assembly (Circular 187); until Oct. 1, three retracting mechanisms (Circular 189); until Oct. 2, open end and box wrenches (Circular 188), six 16-in. motor driven drill presses, one 30-in. similar drill press, and one pedestal type motor-driven drill press (Circular 193); until Oct. 3, one universal testing machine (Circular 182).

Lieber Brewing Co., 1254 South West Street, Indianapolis, has filed plans for three-story and basement addition, for brew-house, storage and distribution, and will begin superstructure at once. Cost close to $100,000 with equipment. Vonnegut, Bohn & Mueller, Indiana Trust Building, are architects and engineers.

SOUTH CENTRAL

Board of Education, Nashville, Tenn., plans manual training department in new three-story high school in West End district, for which bids will be asked on general contract in about 60 days. Cost about $400,000. Donald Southgate, Nashville Trust Building, is architect.

Knoxville Heating & Cooling Co., Inc., Knoxville, Tenn., plans central heating and cooling system to serve entire business and commercial district of Knoxville and certain residential areas. Hot water will be circulated at suitable temperatures for heating during heating season and cold water will be circulated during summer months for cooling and de-humidification. Central plant will consist of motor-driven heating pumps with auxiliaries, and motor-driven circulating pumps for circulation of water through distribution system.

MICHIGAN DISTRICT

Kent Refining Co., Grand Rapids, Mich., plans addition to oil refinery, doubling present capacity from 400 to 800 bbl. crude oil per day. Cost about $75,000 with machinery. Financing is being arranged.

General Motors Corpn., Detroit, has leased former plant of Durant Motor Co., Oakland, Cal., on 17-acre tract, totaling about 400,000 sq. ft. floor space, with option to purchase. Property will be used for expansion in Pacific Coast district, particularly for Chevrolet Motor Co., which now operates an assembling plant at Oakland. Part of acquired plant will be used for storage and distribution at present.

Malleable Casting Corpn., Muskegon, Mich., plans early rebuilding of part of plant recently destroyed by fire. Loss about $35,000 with equipment.

Ford Motor Co., Dearborn, Mich., will soon begin superstructure for one-story plant at Northville, Mich., 100 x 200 ft., for engine valve manufacture, for which contract for sub-structure recently was let to Cooper-Little Co., Maccabees Building, Detroit. It will replace a former plant unit at same place. Cost over $200,000 with equipment.

WASHINGTON DIST.

Purchasing and Contracting Officer, Holabird Quartermaster Depot, Baltimore, asks bids until Sept. 27 for parts for flash and sound ranging trailers, including steel tubing, rivets, sheet steel, spring shackles, nails, wire, springs, etc. (Circular 38); until Sept. 30 for motor truck parts (Circular 39), motor parts, including valve assemblies, shaft assemblies, propeller, grease fittings, etc. (Circular 41).

Procurement Officer, Chemical Warfare Service, Edgewood Arsenal, Md., asks bids until Oct. 8 for five cylindrical tanks, each 500-gal. capacity (Circular 9).

Board of District Commissioners, District Building, Washington, asks bids until Sept. 25 for quantity of cable; until Oct 1, power plant and substation equipment, machinery for sludge dewatering plant for new sewage treatment works at Blue Plains.

Purchasing Officer, Department of Interior, Washington, asks bids until Sept. 25 for galvanized wire (Proposal 953), pole line hardware (Proposal 954).

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Sept. 24 for 7000 ft. cable (Schedule 5960), portable submersible electric-operated pumping units and spare parts (Schedule 5956); until Sept. 27, spare parts for airplanes (Schedule 900-8754), ribs and terminals for airplanes (Schedule 900-8766), for Eastern and Western navy yards; five motor-driven milling machines (Schedule 6009), for Newport, R. I., yard; one motor-driven horizontal boring, drilling and milling machine (Schedule 6003), for Norfolk, Va., yard; until Oct. 1, 260 portable high-pressure air flasks (Schedule 5990), for Washington yard.

SOUTHWEST

United States Engineer Office, Missouri River Division, Kansas City, Mo., asks bids until Sept. 26 for eight 28-in. flap valves and two expansion joint sleeves (Circular 15).

Common Council, Iola, Kan., plans extensions and improvements in municipal electric light and power plant, including new electric turbine unit and accessories, steam generating equipment and auxiliary equipment; also extensions in electrical distributing lines. Cost about $280,000. Financing is being arranged through Federal aid. Paulette & Wilson, Farmers Union Building, Salina, Kan., are consulting engineers.

Sealy Bedspring Mfg. Co., Washington Avenue and National Street, Houston, Tex., has leased one-story factory at 2420 Nance Street, for new plant.

City Council, Yorktown, Tex., plans new municipal electric light and power plant, and electrical distributing system. Cost about $150,000. Financing is being arranged through Federal aid. Garrett Engineering Co., 300 Hughes Street, Houston, Tex., is consulting engineer.

Quartermaster, Army and Navy General Hospital, Hot Springs, Ark., asks bids until Sept. 26 for one motor-driven centrifugal pumping unit and accessories (Circular 3).

PACIFIC COAST

Studebaker Corpn., South Bend, Ind., has let general contract to William P. Neil Co., Ltd., 4761 East Forty-ninth Street, Los Angeles, for one-story automobile assembling plant at Los Angeles, where site was recently acquired. New plant will total about 100,000 sq. ft. floor space. Cost close to $250,000 with equipment.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Sept. 24 for 8500 ft. of pneumatic hose (Schedule 5953); until Sept. 27, 1260 bronze globe valves and 300 angle valves (Schedule 5972), for San Diego Navy Yard; two motor-driven engine lathes (Schedule 5969), one motor-driven abrasion grinding machine (Schedule 5970); until Oct. 1, three fire extinguishers (Schedule 5989), for Mare Island Navy Yard; until Sept. 24, six motor-driven fresh water pumps and spare parts (Schedule 5944); until Oct. 4, two pumping units with accessories (Schedule 6008), for Puget Sound Navy Yard.

Bureau of Reclamation, Yuma, Ariz., asks bids until Sept. 26 for 30,000-gal. steel tank on 60-ft. steel tower at Imperial Dam, All-American Canal System, Boulder Canyon Project (Specification 721-D).

FOREIGN

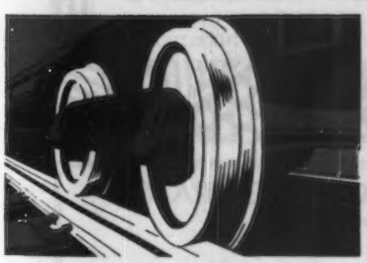
Bureau of National Economy, Government of Mexico, Mexico, D. F., is organizing a new Government-controlled paper-manufacturing interest, to be known as Sociedad Productora e Importadora de Papel, S. A. (Paper Producing & Importing Society, Inc.). Plans are under way for construction of a paper mill, comprising several units, primarily for newsprint production. Cost over $500,000 with machinery. Government will hold a majority of stock and has subscribed a fund necessary for this purpose.

Hydierwerke, A. G., Gelsenkirchen, Germany, recently organized with capital of 10,000,000 rm. (about $4,000,000) by interests identified with Prussian State Collieries, has plans for new works, with power house, mechanical shops and other structures, for production of synthetic gasoline. Cost over $1,000,000 with machinery.

OLD IRON HORSE

Cost

U S STEEL



FOR ALL CARS

Wrought steel wheels (Carnegie and Illinois) are light in weight yet with great strength rolled in for dependability and safety. There are types for every service . . . single and multiple wear.

Steel structures of all classes, turntables, transmission towers and component parts • Black and galvanized sheets, automobile sheets, electrical sheets, sheets for special purposes, tin and terne plates; Keystone Rust-Resisting Copper-Steel Products; USS Stainless and Heat-Resisting Steel; USS High Tensile Steel • Wire fencing, barbed wire, wire rope, electrical wires and cables, nails, manufacturing wires, cold rolled strip steel. Springs • Concrete reinforcement • CB Sections, structural shapes, piling, plates, bars, flats, billets • Axles • Wheels • GEO Track Construction • Rails and track material • Cyclone Chain Link Fence—also lawn fence, wire screen cloth, wire belting, and wire specialties • Special Track Work and Accessories • Standard pipe, copper-steel pipe, rotary rolled pipe, electric-welded pipe, hammer-welded pipe, boiler tubes, seamless mechanical tubing, special dipped and coated pipe, cement-lined pipe, cylinders, couplings • Universal Atlas Cements.

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AMERICAN SHEET AND TIN PLATE COMPANY
AMERICAN STEEL & WIRE COMPANY
CARNEGIE STEEL COMPANY
COLUMBIA STEEL COMPANY
CYCLONE FENCE COMPANY
ILLINOIS STEEL COMPANY
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Steel U S STEEL *Corporation Subsidiaries*

JUST BETWEEN US TWO

In All Modesty

FRANKLY all of us here thought the Sept. 5 issue (Machine Tool Show Number) was a superlative piece of work. No one but a churl would use calipers on a thing of such beauty and utility, but why hide the fact that, with the exception of a few Annuals, it is our biggest issue since November, 1930?

Keep it and cherish it, for it is the most comprehensive book of its kind in print, and will prove a boon and useful companion.

Fifty Years Late

NO doubt you heard about the man who saw the film, "David Copperfield," and remarked that it would make a swell book.

Try This on Your Cerebrum

THE hog and pig feed man, who complains our problems are too easy, sends in this hair-ruffler:

Five men land on a desert island. They gather up all the cocoanuts on the island and then agree to divide them equally the following morning. During the night one man got up, divided the cocoanuts into five equal piles, and had one cocoanut left over. He tossed this to a monkey, which promptly ate it. He hid one pile and threw the other four piles back into one heap. Later in the night another man got up and did the same thing, dividing the heap into five equal piles, throwing the extra cocoanut to the monkey, hiding one pile, and assembling the others into one heap. In like manner, the other three men did the same thing. How many cocoanuts were in the pile originally?

Outgoing Orchid

A PAT on the back to the man who conceived that eye-stopping advertisement of Baker Brothers, Inc., on page 129 of the Sept. 5 Iron Age.

Just So Much and No More

WE try not to appear overgrateful for the bouquets tossed our way. Too much gratitude indicates glad surprise. Most of the time we are able to maintain, without too much effort, an attitude of nonchalance.

Sometimes, and this is one of the times, orchids are so plentiful that we are even able to attain a critical attitude toward them. Some people, we find, eulogize easily; others, difficultly.

Take, for example, the test engineer of a large railroad, who writes:

"I think that the publication is valuable."

Now, that might seem to you to be a niggardly tribute. Yet consider the work of a test engineer. Exactness is necessarily his motto. A man of measured words is he. "Colossal" is not in his vocabulary. His modest petunia may rival another's lush orchid. We are content.

He Said "One Of"

THEN take purchasing agents. They are constitutionally canny folk, trained to look first for the flaw. They are the Sir Huberts. Their nature rebels against applying the blowtorch to lukewarm enthusiasms. They negate freely and praise judiciously.

So this comment made by the chief buying official of one of the great automotive units is satisfying:

"We consider . . . . . it (The Iron Age) one of the best trade papers coming into our plant."

She All Didn't Want It

THROUGH an error we received this letter from Shelby, N. C., intended for one of the large national weeklies:

"Dear frinds:

"I woont to spek to you all and tell you all about the ..... magazine. I did not describe for the magazine. How did you all get my name. It must be for sombody else. It is not me and plese stop writing for pay becose I did not describe for the magazine. How did you all get my name. Plese write and tell me soon.

"My mother and Father can't pay for the book and you all sent other Girl the ..... book and she said that she did not describe for it and she said that she did not pay for it.

"You all got my name rong and stop senting me the book. I will close my letter for the time and what I told you all and stop write for paye. I not no one of your describers."

—A.H.D.